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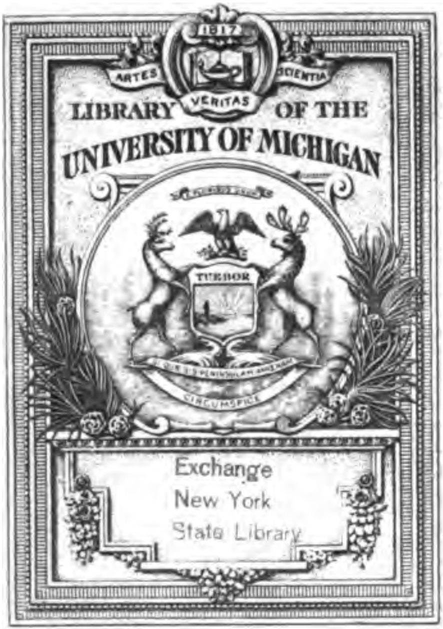

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STATE OF NEW YORK

Conservation Commission

NINTH ANNUAL REPORT

FOR THE YEAR 1919

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STATE OF NEW YORK

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CONTENTS

PAGE
Introduction 1
General Topics 3
    Conservation and Nervous Tension 5
    Registration of Guides 8
    Pollution of Waters 10
        Importance of the Problem 10
        Administrative Program 13
        Scientific Programs 16
        Results 17
        Systematic Work Necessary 20
    Educational Work 20
    Receipts and Disbursements 23
        General 23
        Division of Saratoga Springs 24
        Return on the Investment 24
Division of Fish and Game 25
    Receipts 27
    Game Protection 29
        Cases and Recoveries 29
        Analysis of Violations 31
        Prosecutions and Recoveries, July 1, 1918, to June 30, 1919 32
        Seizures 33
        Uniforms 33
    Increased or Decreased Protection 35
    Game Breeding 36
    Game Farms 36
    Campaign against Vermin 38
    Biological Investigations 40
        Reports from Hunters on Game Killed 41
        Ruffed Grouse 42
        Deer 43
        Beaver 48
    Hunting License Fees 52
    Bureau of Marine Fisheries 53
        Surveys 53
        Chemical and Bacteriological Tests 54
        Acreage under Lease and Franchise 55
        Decline of the Oyster Industry 56
    Bureau of Inland Fisheries 61
        The Burbot Fishery 63
        Set Lines 63
        Shad Fishing 63
        Spearing Permits 67
        Carp 67

Division of Fish and Game — Continued: PAGE

Bureau of Fish Culture.. 67
  Applications for Fish.. 68
  Live Fish Exhibits... 71
  Canal Ponds.. 71
  Stream Surveys... 73
  Notes on Hatcheries.. 75
    Adirondack Hatchery.. 75
    Bath Hatchery.. 75
    Caledonia Hatchery... 75
    Chautauqua Hatchery.. 76
    Cold Spring Harbor... 76
    Delaware Hatchery.. 77
    Fulton Chain Hatchery.. 78
    Linlithgo Hatchery... 78
    Oneida Hatchery.. 79
    St. Lawrence Hatchery.. 80
    Warrensburg Hatchery... 81
    Dunkirk Hatchery... 82
  Distribution of Fish by Species.. 84
Division of Lands and Forests.. 85
Introduction... 87
The Forest Preserve.. 88
  General.. 88
  Trespass... 89
  Occupancy.. 91
  Surveying.. 93
  Fire Protection.. 95
  Reforestation.. 96
  Acquisition.. 96
  Summary of Land Acquisition, 1919...................................... 102
  Forest Preserve Area... 103
  Public Use... 105
    Recreation Circulars... 117
  Protecting Lake George Islands... 121
John Brown Farm.. 124
St. Lawrence Reservation... 124
Cuba Reservation... 125
Forest Fire Protection... 126
  General.. 126
  Fires of the Year.. 129
  Summary of Forest Fire Losses, 1919, by Counties....................... 132
  Summary of Forest Fire Losses, 1919, by Causes......................... 133
  Fires Reported from Mountain Stations in 1919.......................... 134
  Violations of Fire Laws.. 135
  Equipment.. 135
  Long Island Fire Protection.. 139
  Weeks Law.. 139
Rating of Rangers.. 140

Division of Lands and Forests—Continued: PAGE

- Reforestation 140
  - General 140
  - Nurseries 141
  - Reforesting the Forest Preserve 142
  - Planting by State Institutions 142
  - Sales of Trees 142
- White Pine Blister Rust 143
  - General 143
  - Eradication 143
  - Blister Rust Control Work, 1919 145
  - Experimental Work 146
  - Scouting 146
  - Fruiting Currant Districts 147
- State-Wide Forestry 147
  - General 147
  - Timber Shortage in New York State 151
  - State-Wide Forestry Necessary 153
  - Area of Forest Land 153
  - Specific Administrative Program 155
    - Forestry Districts 155
    - Forest Protection 156
    - Forest Survey 159
    - Reforesting 159
    - Scientific Cutting 161
    - Marketing 161
    - Forest Recreation 162
  - General Recommendations 163
    - Free Trees for Reforestation 163
    - Constructive Forest Taxation 164
  - Benefits of State-Wide Forestry 166
- Forest Products in 1918 167

Division of Waters 175
- Water Power Policy 177
  - Regulation of Stream Flow 18
  - Assessment of Costs of Storage Reservoirs 181
  - Assessment of Benefits 182
  - Power Dams at State Owned Sites 184
  - State Owned Power Sites Should be Leased 185
  - Benefits to the Public 186
  - Summary of Power Policy 187
- Making the Power Policy Effective 188
  - Leasing of Barge Canal Powers 189
  - Revision of Water Storage Laws 189
  - Authority to Lease Power Sites 192
  - Power Development and Transmission in the Forest Preserve 192
  - Unused Water Power Charters 192
  - Boundary Waters 192
  - Stream Regulation a Public Use 194
  - Summary of Necessary Water Power Legislation 195

Division of Waters — Continued:

PAGE
Basis for Immediate Action on Water Power Development................ 196
Water Supply and Sewerage.. 199
Docks and Dams... 200
Water Power and Storage Surveys................................. 201
    Black River... 201
    Ausable River... 202
    Ord's Falls Project... 202
    Schroon Falls Reservoir..................................... 202
Black River Regulating District.................................. 203
Drainage.. 204
    Orange County Project....................................... 204
    Porter-Lewiston Project..................................... 204
    Capen Project... 205
    Drainage Legislation.. 205
Canaseraga Creek Improvement..................................... 206
Hydrographic Investigations...................................... 207
General Engineering.. 208
    Long Point Dock... 208
    Fish Hatchery Surveys....................................... 208
    Dunkirk Fish Hatchery....................................... 208
    Adirondack Hatchery... 208
    State Land — Water Power Estimates.......................... 208
    Lake George Regulation...................................... 209
Division of Saratoga Springs..................................... 211
Increased Business... 213
Treatments Given in State Bath Houses............................ 214
Remittances to Comptroller....................................... 216
Net Profits.. 216
Increased Costs of Operation..................................... 216
Future Development... 217
The Drink Hall... 219
Saratoga Bath House.. 220
Washington Baths... 223
Heating Plant.. 225
The Bottling Plants.. 225
Wells, Springs and Pipe Lines.................................... 227
The Chemical Laboratory.. 229
Parks and Roads.. 230
Summary of Legislative Recommendations........................... 233
    General... 235
    Division of Fish and Game................................... 235
    Division of Lands and Forests............................... 237
    Division of Waters.. 237
    Division of Saratoga Springs................................ 238
Conservation Bureau, Attorney General's Office................... 239
Financial Statement.. 245

DIVISION OF FISH AND GAME — SUPPLEMENTARY STATISTICS

PAGE
Hunting and Trapping Licenses.................................... 259
Game Protectors' Shooting Competition.................................... 260
Bureau of Inland Fisheries.................................... 262
    Returns of Licensed Fishermen.................................... 262
Bureau of Marine Fisheries.................................... 264
    Receipts.................................... 264
Bureau of Fish Culture.................................... 264
    Fish distribution during 1919.................................... 264
    Distribution of Fish by Station.................................... 265
        Bath.................................... 265
        Caledonia.................................... 265
        Chautauqua.................................... 266
        Cold Spring Harbor.................................... 267
        Delaware.................................... 267
        Fulton Chain.................................... 267
        Linlithgo.................................... 268
        Oneida.................................... 268
        St. Lawrence.................................... 269
        Warrensburg.................................... 269
        Dunkirk.................................... 269
    Canal Ponds.................................... 269

DIVISION OF LANDS AND FORESTS — SUPPLEMENTARY STATISTICS

Forest Fires:

    Summary by Months and Counties.................................... 273

Reforestation:

    Nursery Production.................................... 274
    Utilization of Nursery Stock.................................... 275
    Inventory of Trees in Nurseries.................................... 276

DIVISION OF WATERS — SUPPLEMENTARY STATISTICS

Applications for Approval of Docks and Dams.................................... 279

APPENDIX A— Water Supply and Sewerage

Introduction.................................... 283

Decisions on Water Supply Applications:

    Spring Brook Water Company.................................... 285
    Glenwood Water District.................................... 289
    Village of Newark.................................... 292
    Village of Voorheesville.................................... 299
    Village of Sidney.................................... 303
    Village of Nassau.................................... 309
    Clover Street Water District.................................... 314
    Village of Long Beach.................................... 317
List of Sewerage Applications.................................... 322

APPENDIX B — Hydrographic Investigations

PAGE
Letter of Transmittal 327
General Statement 329

Hudson River Drainage:

Hudson River at Gooley near Indian Lake 330
Hudson River at North Creek 332
Hudson River at Thurman 334
Hudson River at Spier Falls 336
Hudson River at Mechanicville 337
Indian Lake Reservoir at Indian Lake 339
Indian River near Indian Lake 341
Schroon River at Riverbank 342
Sacandaga River near Hope 344
Sacandaga River at Hadley 346
Feeder Canal at Glens Falls 348
Hoosic River near Eagle Bridge 350
Mohawk River at Vischer Ferry Dam 351
Mohawk River at Crescent Dam 354
West Canada Creek at Hinckley 356
Nine Mile Feeder near Holland Patent 357

Delaware River Drainage:

East Branch of Delaware River at Fish Eddy 358
Delaware River at Port Jervis 359
Beaver Kill at Cooks Falls 361
West Branch of Delaware River at Hale Eddy 363

Susquehanna River Drainage:

Susquehanna River at Conklin 365
Chenango River near Chenango Forks 367
Chemung River at Chemung 368
Tioga River near Erwins 370
Cohocton River near Savona 372
Cohocton River near Campbell 374
Mud Creek at Savona 376
Allegheny River at Red House 379
Cattaraugus Creek at Versailles 380

St. Lawrence Drainage:

Little Tonawanda Creek at Linden 382
Genesee River at Scio 383
Genesee River at St. Helena 385
Genesee River at Jones Bridge near Mt. Morris 387
Canaseraga Creek near Dansville 389
Canaseraga Creek at Cumminsville 390
Canaseraga Creek at Groveland Station 393
Canaseraga Creek at Shakers Crossing 395
Keshequa Creek at Craig Colony near Sonyea 396
Canadice Lake Outlet near Hemlock 398
Owasco Outlet near Auburn 399
Black River near Boonville 401

St. Lawrence Drainage—*Continued:*

PAGE
Black River at Black River 403
Forestport Feeder near Boonville 404
Black River Canal near Boonville 407
Moose River at Moose River 409
Middle Branch of Moose River at Old Forge 411
Beaver River at State Dam near Beaver River 413
Oswegatchie River near Heuvelton 415
East Branch of Oswegatchie River at Newton Falls 417
West Branch of Oswegatchie River near Harrisville 419
Raquette River at Piercefield 420
St. Regis River at Brasher Center 422
Richelieu River at Fort Montgomery 424
Lake George at Glen Island 425
Lake George at Rogers Rock 425
Ausable River at Ausable Forks 426
West Branch of Ausable River near Newman 428
Saranac River near Plattsburg 432
Genesee River at Rochester 434

APPENDIX C — Power and Storage Possibilities of the Ausable River

Introduction 439
Ausable Watershed 439
Hydrology 440
Stream Flow 440
Need of Regulation 442
Storage Possibilities 442
Ausable Lakes Reservoir 442
Keene Valley Reservoir 444
Cherrypatch Pond Reservoir 444
Other Storage Possibilities 446
Black Brook Reservoir 448
Augur Lake Reservoir 448
Method of Regulation 449

Power Developments and Possibilities

East Branch:

Ausable Lake-Beede Project 450
Hulls Falls 450
Keene 452
Upper Jay 452
Jay 452

West Branch:

High Falls 452
Wilmington 452
Ausable Forks 453
Clintonville 454
Keeseville 454
Alice Falls 456
Explanation of Power Table 458

APPENDIX D — Duration Flow Curves of New York State Streams

PAGE
Introduction.......... 465

Diagram No. 1:
Hudson River at Troy.......... 468
Oswego River at Battle Island.......... 468
Hudson River at Mechanicville.......... 471
Mohawk River at Vischer Ferry.......... 471
Hudson River at Spier Falls.......... 471

Diagram No. 2:
Chemung River at Chemung.......... 471
Susquehanna River at Binghamton.......... 474
Black River at Felts Mills.......... 474
Allegheny River at Red House.......... 474
Oswegatchie River at Ogdensburg.......... 474
Chenango River at Binghamton.......... 474

Diagram No. 3:
Sacandaga River at Hadley.......... 474
Genesee River at St. Helena.......... 474
East Branch Delaware River at Hancock.......... 474
Hudson River at North Creek.......... 474
West Branch Delaware River at Hancock.......... 475

Diagram No. 4:
Raquette River at Piercefield.......... 475
St. Regis River at Brasher Center.......... 475
Saranac River near Plattsburg.......... 475
Schroon River near Riverbank.......... 475
Ausable River at Ausable Forks.......... 475
Canandaigua Outlet at Alloway.......... 475

Diagram No. 5:
Moose River at Moose River.......... 475
West Canada Creek at Twin Rock Bridge.......... 475
East Canada Creek at Dolgeville.......... 475
Schoharie Creek at Prattsville.......... 475
Owasco Outlet near Auburn.......... 475
Salmon River at Stillwater.......... 476
Esopus Creek at Coldbrook.......... 476

Diagram No. 6:
Beaver River at Stillwater.......... 476
Nine Mile Creek near Stittville.......... 476
Alplaus Kill near Charlton.......... 476
Little Tonawanda Creek at Linden.......... 476
Canadice Lake Outlet at Hemlock.......... 476
Stream Flow Studies.......... 477

APPENDIX E — Maximum and Minimum Flows of Streams in New York State. 483

ILLUSTRATIONS

PAGE
Happier That They Slipped off Their Pack of Duties 4
Map of Stream Pollutions 11
Protectors at Revolver Practice 28
Song Birds Seized in Westchester County 30
Illegal Nets Taken in Raid on Lake Champlain 31
Illegal Net Seized in Trout Stream 34
Protectors Taught to Protect Themselves 35
Crops Improved by Protection of Insectivorous Birds 36
Hatching Coops on State Game Farm 37
Broken Game Laws Poster 39
A Good Coon and a Good Coon Dog 41
Deer Hunters of 1919 44
Protective Coloring of Fawns 47
Trees Flooded and Killed by Beaver 49
Shore Line of Eighth Lake Destroyed by Beaver 51
Lake Gilead Stocked with Trout 70
Rearing Troughs at Warrensburg Hatchery 81
Spruce Stump Showing Blaze of Survey of 1820 93
Mount Marcy from Top of Haystack 94
Primeval Forest Acquired Under Bond Issue 97
Cutting of Pulp Wood to be Stopped by Acquisition of Marcy 98
Trees Blown Down on Lumbered Mountain Slopes 99
West Canada Lake a Recent Addition to the Forest Preserve 100
Watershed of Raquette River Protected by Forest 104
Boy Scouts Camping on Islands of Lake George 106
Avalanche Lake, a Highway of Travel for the Iroquois 107
Indian Pass an Ancient Thoroughfare 108
Haines Falls in the Catskills 110
Forested Ranges of the Catskills 111
Camp Sites on State Islands of Lake George 112
Hanging Spear Falls in Victory Mountain Park 113
Superb Scenery Around Mount Marcy 114
Mountain Climbing on Mount Marcy 115
Adirondack Log Lean-to 116
Camping Without a Permit 117
Roads and Trails in a Federal Forest Preserve 119
Arrow Guides for Vacationists 120
Part Owners of the Forest Preserve 121
High Water Threatening Lake George Islands 122
Docks and Islands of Lake George Flooded by High Water 123
Cuba Reservation, a Vacation Center 125
Forest Fire Poster 126
Poster Warning Sportsman Against Fires 127
Devastation Caused by Forest Fire 128

PAGE
Map Table and Sighting Device for Forest Fires 130
Visitors to Cabin of Mountain Observer 131
Observer's Shelter on Ampersand Mountain 136
Panoramic Map for Locating Forest Fires 137
Fire Tower on Telescope Hill, Long Island 139
Trees in Nursery Ready for Shipment 140
White Pine Blister Rust 144
Need for Greater Supply of Wood for Industrial Use 148
Barren Wastes of Long Island, the Result of Forest Fires 150
Pines Planted on Long Island 151
White Pine Growing on Sandy Soil of Long Island 152
Farm Woodlots May be Made Productive by State Aid 154
Forest on Land Cultivated Forty Years Ago 157
European Planted Forest 163
Horse Power Traveling upon Strands of Wire 179
Interior of Power House 182
Water Power Harnessed to Prevent Waste 186
Wood Pulp for the Printing Press 191
Street in Albany Flooded by Hudson River 193
Future Development of State Reservation, Saratoga Springs 218
Washington Baths of the Saratoga Reservation 222
Ausable River at High Falls 441
Ausable River at the Flume 447
Ausable River at Entrance to the Chasm 451
Ausable River at Alice Falls 455
Ausable River above the Chasm 455

SUPPLEMENTS

St. Lawrence Reservation, *Recreation Circular 5,* showing the location of the State parks in the Thousand Island region and their accessibility. (With Map.)

Adirondack Canoe Routes. *Recreation Circular 7,* outlining a canoe trip of 125 miles, from Old Forge to Paul Smiths, with side trips on many lakes and rivers. (With Map.)

NINTH ANNUAL REPORT

OF THE

CONSERVATION COMMISSION

To the Legislature:

Pursuant to statute, the Conservation Commission begs to submit, for the consideration of your honorable body, a report of its work for the past year, as well as certain recommendations which it trusts will meet with your approval.

In the text of this report the discussion of the work of the Commission has been carried down to the end of the calendar year, December 31, 1919. Financial and other tables which are directly related to the fiscal year are, however, carried only to the end of the fiscal year, June 30, 1919. This method of preparing the report has been adopted because of the fact that the Legislature each year must consider many questions of conservation which require knowledge of the Commission's doings down to date, and not merely information that is already six months old.

Under the statute the work of the Commission is grouped into four divisions. This report accordingly considers each division in turn, preceding them, however, with a discussion of general topics. This is followed by the report of the Conservation Bureau of the Attorney-General's Office and the Annual Financial Statement of the Commission. The arrangement is as follows:

I. General Topics.
II. Division of Fish and Game.
III. Division of Lands and Forests.
IV. Division of Waters.
V. Division of State Reservation at Saratoga Springs.
VI. Summary of Legislative Recommendations.
VII. Conservation Bureau, Attorney-General's Office.
VIII. Financial Statement of the Conservation Commission.

GENERAL TOPICS

“Sleep on the fragrant brush, as on down-beds,
Up with the dawn, they fancied the light air
That circled freshly in their forest dress
Made them to boys again. Happier that they
Slipped off their pack of duties, leagues behind.”
Emerson.

(From “The Philosophers' Camp”, in *The Adirondacs.*)

GENERAL TOPICS

CONSERVATION AND NERVOUS TENSION

When increased attention began to be given to conservation, particularly following the calling of the first Conference of Governors in Washington by President Roosevelt in 1908, it was clearly recognized that conservation touches the life of the people upon practically every side. Many phases of the work have nevertheless received comparatively little direct attention on the part of conservation commissions, under whatever names they are known, in any of the states.

Nearly every state has a carefully developed system for the conservation of wild life, and the more progressive states do similar constructive work in forestry. In some of them also the conservation of mineral resources receives much attention, while in a number the control of stream flow, or the whole broad subject of water conservation, is prominent.

Within the last few years more attention has been paid than ever before by certain state commissions and by departments of the national government to the relation of the conservation of wild places and wild life to the general physical and mental well being and happiness of the people. It is a subject that is acquiring increasing importance, as the high tension of our social and industrial organization is becoming constantly more acute.

With power driven machinery, steam and electric railways, telephones, the telegraph and the wireless, and finally the aeroplane, all commonplaces of our daily existence, we are prone to forget that our grandparents lived under no such nervous strain as these inventions have brought with them, and that only three or four generations ago the high speed of modern life would have been actually inconceivable.

Students of our social and industrial conditions are satisfied that the human organism has not yet adapted itself to the high nervous tension of modern life. Scarcely more than one hundred and twenty-five years have sufficed to completely reorganize the mechanical details of production from the old, domestic system, under which our ancestors worked, to the highly developed factory system of today. Prior to the invention of the steam engine in the latter part of the eighteenth century, industry was conducted largely at home, in small towns or in the country. Practically every family lived in its own house, and cultivated land from which much of its food supply was obtained. The daily duties of each member of the family and of the servants or employees, who constituted practically a part of the family, were extremely varied and largely unhurried.

The invention of the steam engine, and all of the other industrial advances that followed in its train, radically changed industrial and living conditions. Industry became concentrated in factories; factories required labor in larger blocks, and readier access to lines of transportation; towns and cities grew in size, as the workers, driven for their livelihood from the country and small towns to the factories, were obliged to give up their country life. In short, the domestic system of industry of the eighteenth century, with all of the advantages that it held for healthful occupation and physical and nervous relaxation, gave place to the factory system of the nineteenth and twentieth centuries, as we know it today, with its high tension machine work, monotony of occupation, and decreased opportunity for healthful relaxation.

In this short time wonderful strides have been made in the mechanical arts. The failure of the human organism, however, to adapt itself to the changed conditions constitutes one of the greatest physical and social menaces of today, and, in the opinion of many of the most careful students of industrial and social conditions, threatens an actual break-down of society.

Students of the causes of social unrest are inclined to attribute many of our present social difficulties to the boredom of machine production, and to the requirements of modern efficiency, which involve mental concentration and routine endeavor at the expense of variety and individuality. Thus, while machine efficiency has brought many comforts and luxuries unknown and even undreamed of a century ago, it has created a series of evils, apparently traceable to monotony and nervous tension, which are believed to be at least partly responsible for many of the most disquieting conditions of modern industry and society.

Relaxation from the physical and mental strain of modern industrial life is a vital necessity. This has never been more clearly apparent than since the termination of the war. Social and industrial unrest following the strain of the war has been world-wide, and relaxation of every sort has been apparent upon every hand. The nations of Europe, even defeated Germany, are reported to have run madly in the pursuit of pleasure. The entire situation is complicated to a high degree, and cannot readily be generalized in a short discussion. It is apparent, however, that relaxation is a fundamental need of all people, and that one of the most wholesome and popular methods of obtaining this relaxation is in out-of-door recreation.

This need for out-of-door recreation gives an added importance to New York State's great Forest Preserve in the Adirondack and Catskill Mountains, and to the wild life which it is the duty of the Conservation Commission to protect and increase in all parts of the State.

Any attempt to cover even briefly all of the various ways in which people seek recreation in fishing, hunting, camping, tramping and touring, whether for a day at a time, or for much longer periods, would require many pages. The Forest Preserve this last summer has received more vacationists than ever before. The Palisades Interstate Park, lying at the very door of New York city, is the resort each year of not less than 1,000,000 persons. The demand for hunting licenses in New York State last year was so great that the supply in the hands of many town clerks was exhausted before the year was two-thirds finished, and the total number issued by the Commission ran approximately 50,000 more than in the preceding year.

In all quarters, the importance of conservation of resources for their recreational value is more fully recognized. The Commission has pointed out in other years the social service value of conservation. Even industrial establishments are now supporting local conservation work, because of appreciation of the importance of good fishing and other out-of-door recreation for the welfare of their employees, The national government, through the Forest Service and the Department of the Interior, is developing the national parks and forest preserves to the fullest possible extent as recreation centers, and is finding that they play a most important part in the lives of the people.

The Conservation Commission during this last year has undertaken similar work in the recreational development of the Forest Preserve, which is more fully discussed on page 105. This recreational development of the State's great vacation grounds, the conservation of fish and game, and all that the State can do through the Conservation Commission and any other State agencies to provide proper facilities for out-of-door recreation, is work of vital importance to the people, as an off-set to the nervous strain of our modern highly organized industrial and social life.

REGISTRATION OF GUIDES

The Legislature at its last session passed a bill, which was signed by the Governor, authorizing the Conservation Commission to maintain a register of persons competent to engage in the business of guiding in that portion of New York State known as the Forest Preserve counties, and to issue a license and distinguishing badge to qualified persons.

The purposes for which competent guides are now registered in the Forest Preserve counties of New York State are to bring about better protection of the forests against fire, more effective game protection, and more complete enjoyment by vacationists of the State's great Forest Preserve. It has long been realized that the interests of the Conservation Commission, the vacationists, and the guides are identical. The registration of guides is a step in the direction of greater unity in the protection and enjoyment of the great natural resources with which all three are concerned.

For the purpose of making the Forest Preserve increasingly available and enjoyable to the people of the State, all of whom own it jointly, the Conservation Commission has begun the publication of a series of illustrated recreation circulars, showing its accessibility and describing its recreational advantages. It is a logical part of the Commission's plan for developing the recreational side of the Forest Preserve that a register of competent guides be published and distributed in connection with the recreation circulars. If vacationists understand where they may obtain competent guides, they will make much fuller use of the Forest Preserve, and the fact that they are guided by such competent men will mean that the danger of carelessly setting fires will be reduced and better game protection be obtained. It will result in more and better forest cover, more game, more sport, and more business for the large number of people whose chief occupation now is the entertainment of vacationists in the Forest Preserve counties of the State.

The registration of guides is not compulsory, and anyone may engage in the business of guiding, whether he is registered or not. The law is not intended to interfere in any way with this occupation, but it is designed to provide a directory of competent guides, for the purposes outlined in the first paragraph of this discussion, and to place that directory in the hands of the largest possible number of users of the State's Forest Preserve.

In the formulation of the Rules and Regulations for the registration of guides, the Commission has provided for having the law administered primarily by the guides themselves, through district guides' committees. The Forest Preserve counties have been divided into eight districts, and in each of these districts a guides' committee of three men has been appointed by the Commission, until such time as the guides themselves can meet and elect their own committees.

Applications for registration, when received by the Commission, are referred to these committees for investigation and report, before the applicants are registered. It is felt that in this way it will be possible to limit the registration more effectively to men actually engaged in the business of guiding, and who are thoroughly competent. It was found at the very beginning that many applications were received from persons not engaged in the business of guiding, many of them living outside the Forest Preserve counties, who apparently desired to obtain registration as guides as a testimonial of their ability as woodsmen. This in itself indicates that State endorsement of a person as a competent guide is considered very desirable. The Commission has felt, however, that the registration of persons not actually guides would defeat the purpose of maintaining the register, which is to provide a list of competent persons whom vacationists may readily employ on their trips into the woods. The applications of persons not actually guides have accordingly been acted upon adversely.

At the time of writing this report, the Commission had registered 176 guides. There were also on file 54 applications for registration, which were being held for submission to the district guides' committees. A preliminary list has been published, and many requests for it have been received, notwithstanding that the list was not ready until late in the season. It is anticipated that the revised list, which will be ready in advance of the next vacation season, will be of great assistance to vacationists in connection with the recreation circulars of the Division of Lands and Forests.

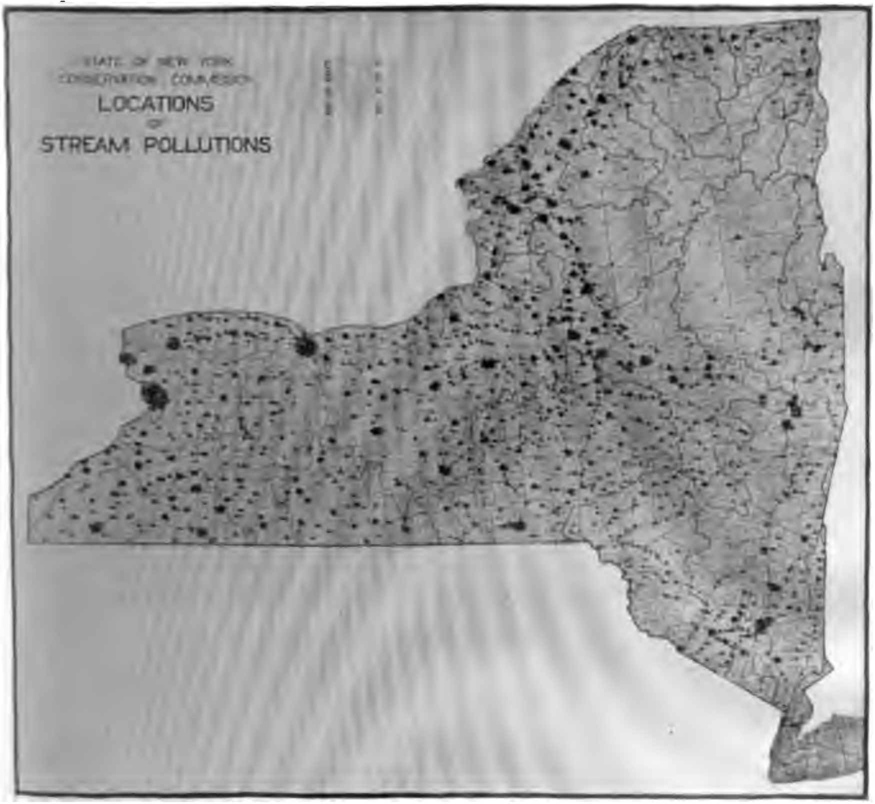
POLLUTION OF WATERS

Importance of the Problem. At the last session of the Legislature, a bill was passed and signed by the Governor, authorizing the Conservation Commission to "investigate the extent and character of and methods for eliminating the pollution of water." The bill carried an appropriation of $10,000 for the expenses of this work.

This is a subject to which the Commission had been giving special attention since the summer of 1918, when a preliminary study of the extent of the evils of pollution was made for the Commission by Dr. Henry B. Ward, professor of zoology in the University of Illinois. This preliminary study indicated that the quality of the waters of the State has become so impaired by wastes of many kinds, and this condition has been rapidly becoming so much more serious, that remedial measures are imperative.

Following the passage of the law of a year ago, which authorized the Conservation Commission to study the subject on a broader basis than heretofore possible, the Commission has devoted a great deal of attention to the working out of a systematic and comprehensive program for conserving the quality of waters, so as to direct work under existing statutes to the broadest interests of conservation.

Conservation of the quality of water is a subject of many ramifications, in which many agencies are interested in some special way, but which must make its strongest appeal as a unified problem to conservationists. The quality of water is quite as much a natural resource as its quantity. Quality is vitally important from a biological standpoint, in which conservationists are particularly interested. Quality is also of fundamental importance to many industries which require water, chemically or otherwise pure, in their processes. It is also of tremendous importance to individuals and communities from the standpoint of public health and recreation. Any proper plan for conservation of the quality of water must accordingly take account of the value of water from the standpoint of biology,



The map of stream pollutions in New York State is a visual representation of conditions upon every watershed.

industry, public health, aesthetics and recreation, as distinguished from its quantity value in water power and navigation, and endeavor to correlate all of the existing agencies for conserving this quality.

It has long been recognized as one of the most important functions of conservation to increase the quantity of water by protection of forests and regulation of stream flow, and it seems quite as clear that conservation of the quality is equally and primarily a matter of conservation. In this country, however, work upon the quality of water, as a unified administrative problem, is only beginning, the most important accomplishments heretofore having been in the field of public health. The State will accordingly be taking a great step forward when it recognizes the unity and importance of the problem of the conservation of the quality of water, as it has of the conservation of the quantity. The Geological Survey has attempted to do this to some extent, but so far as the Commission is aware, such a broad program, including waters in general, as has been developed for the guidance of the work here, has not heretofore been adopted by any governmental agency in this country.

Because of the special nature of the problems presented, the Commission immediately undertook to secure the services of a man with the necessary technical training in aquatic biology and sanitation. The difficulty that was immediately encountered in finding men of the proper education and experience to fit them for this work is indicative of the lack of attention that has heretofore been given in this country to this important subject. In European countries men have long been specially trained in the various branches of biology, chemistry, and engineering, which underlie work upon pollution. This difficulty of finding a specialist was further increased because of the war. It was accordingly not until November first that the Commission was able to fill the position. On that date Captain William Firth Wells, who had been with the Sanitary Corps in France, was engaged as biologist and sanitarian. In the meantime, however, certain details of the work were taken up by the regular engineering staff of the Commission, with special assistance in biology from Dr. Peter W. Claassen of Cornell University.

Administrative Program. After the engagement of Captain Wells, the first work that was undertaken was the final working out of the details of a broad, administrative program. This program, which has now been completed, is a broad survey of the whole subject of quality conservation of water from the administrative standpoint, and under it much definite and systematic work is now possible with the existing laws. The program, however, has been conceived in a broader spirit than that of statutes now in force, though it provides for work under the present statutes. It thus anticipates the future development which must necessarily come in this and other states as the importance of the quality of waters is more thoroughly appreciated.

With this broad survey of the field completed, it is now possible for the Commission, as an administrative agency, to take up any case of pollution, or any phase of the work of improving the quality of water, with an understanding of the significance of that case or of any detail of the work to the whole problem. This makes it possible to direct the work with proper emphasis upon those problems that are in most urgent need of solution. When it is considered how wide-spread pollution has become, and how intricate are the problems which it presents, the importance of such a working program is more readily understood.

The present status of the problem makes it necessary to strive to utilize the forces which may be already available. To obtain the best results, an endeavor must be made to coordinate the work of all parties. In so far as New York State is concerned, the Conservation Commission is in position to act as an intermediary between various interests not otherwise in touch, but generally concerned in the problem of conservation of the quality of water, whether these interests are within the State or outside.

The administrative program, which is designed as a basic structure, upon which the work of eliminating pollution can be systematically developed, accordingly takes into consideration the importance and unity of the problem and the various agencies at work upon it.

Because of the extent of the subject, and the importance of having a definite objective clearly in mind, and also to facilitate the handling of each situation as it arises, it is important to classify the various types of waste from an administrative point of view, and to lay down a definite method of procedure under each classification. The word "pollution" is a very broad, general term, which includes within its scope a large number of different kinds of polluting substances, varying greatly in their characteristics, and accordingly requiring different methods of handling. Systematic, administrative work upon these various substances must accordingly start first with a classification of those substances according to type, each type including the substances that should be subjected to the same general administrative action. This classification recognizes that at the present time certain things are practicable, while others are impracticable, based upon the present state of scientific knowledge. The program accordingly takes this into full consideration as a condition of progress.

The classification of wastes from the administrative standpoint will be quite different from the usual classifications of chemists or sanitary engineers. The administrative officer is interested primarily in eliminating stream pollution, and he must accordingly first ask himself whether any given case of pollution is sufficiently detrimental to require action, and second, if action is needed, what general classes of action he should take as an administrative officer. Accordingly, because of the special point of view that must be taken on this subject by the Commission as an administrative body, cases of pollution have been classified as follows:

I. INNOCUOUS WASTES.

These are the wastes that are not detrimental, and require no special treatment, and may be permitted to go into the stream.

II. SANITARY SEWAGE.

The State Department of Health is handling the sanitary sewage of the State in a very satisfactory manner, and the installation of disposal works for treating it is proceeding at a very encouraging rate. While the Commission has certain jurisdiction over sanitary sewage under the provisions of the Conservation Law, this is nevertheless a matter primarily for the Department of Health, and the Commission has accordingly felt that the handling of sanitary sewage should be relegated to the State Department of Health, except in so far as action is required by this Commission under the present law.

III. PROHIBITED WASTES.

Certain kinds of wastes are so clearly detrimental that they should not be allowed at any time to enter public waters. This type accordingly includes those wastes that are a positive and direct detriment, and that are capable of handling by absolute exclusion from the water.

The wastes under this type are those that are produced in the course of the manufacturing processes, independently of the use of the water into which it is customary ultimately to turn them. Thus, while these wastes are not mixed with water, or at least not with large quantities of it, as a necessary incident in the manufacturing process, the practice heretofore has nevertheless been to dispose of them by finally turning them into the stream as the easiest method of their disposal. It is clear that the method of handling them by actual exclusion from the public waters is entirely feasible by administrative methods.

IV. TRADE WASTES REQUIRING TREATMENT.

A great many trade wastes which prove detrimental when untreated, are capable of such treatment that the resulting effluent is innocuous. The wastes under this type are those introduced into the water through the use of the water in the actual processes of manufacture. This accordingly means that such wastes, because of their admixture with large quantities of water, must undergo a treatment process for the purpose of removing them entirely from the water before the water is returned to the stream, or rendering them innocuous without actual removal from the water. In some of these cases a by-product may be obtained as the result of treatment, which has an actual financial value.

Two sub-types are recognized as follows:

A. Wastes Requiring Treatment Known, Practicable, and Effective.

The Commission is constantly issuing permits for disposal of wastes of this sub-type, by discharging them into streams, after satisfying itself that the results of the proposed treatment will be satisfactory. The handling of cases of pollution under this sub-type presents few problems of a scientific nature, the chief task being the administrative one of securing treatment.

B. Trade Wastes Requiring Further Study.

The method of treatment of many trade wastes now detrimental, and impossible of disposal otherwise than by running into streams, is not understood. The wastes in this sub-type are so many, and the damage that they do is so extensive, that their gradual elimination must constitute one of the most important and difficult phases of the work. Here, as at other points, throughout this program, one of the guiding principles to be followed is that of directing action towards ends that are possible of accomplishment without serious detriment to industry. Thus, if the wastes of a particular industry can at the present time not be excluded from public waters or made innocuous without a serious impairment of that industry, this plan contemplates that that industry be placed in this class, which provides for scientific study of the problems presented.

Scientific Programs. In the practical work of bringing about the gradual elimination of detrimental pollution of various types, above outlined, programs for careful scientific work must be developed. Thus, it will be necessary to conduct investigations of one character upon organic wastes, and of another character upon wastes that are inorganic. Certain treatments will be effective with acid wastes, whereas wholly different treatments must be developed for alkaline wastes. Programs for scientific work, of primary importance to the biologist, chemist and engineer, will, however, all be subservient for the Commission to a general administrative program. The Commission has accordingly worked out its plan for systematic work in the whole broad field of pollution, with a proper place under that plan for all of the scientific work that will be necessary. Complete discussion of that plan requires more space than is available in this brief report to the Legislature, but its various details will appear from time to time in special publications of the Commission on this subject.

Results. In addition to the careful surveying of the whole field, and the formulation of a basic working program, under which each detail of the work may be taken up with full appreciation of it proper position in the whole scheme, the Commission has gone ahead as rapidly as possible to accomplish concrete results, which are here only briefly detailed.

The result of Professor Henry B. Ward's preliminary survey of the State has been published. It is a biological study of the effects of pollution and of the general principles which must underlie the work of improving conditions. This study by a biologist of such standing and authority has already been of great value to the Commission in formulating its plans, and has attracted attention in other states, showing that it is equally helpful elsewhere.

An effort has been made to discover the location of all plants which are now discharging, or are likely to discharge, waste matters into the streams of the State. Information with regard to some three thousand of these plants has been obtained and classified. These plants have also been located on a large scale map of the State, each being shown by a pin, the color of the head of which indicates the nature of the industry to which the plant is devoted. Inspections have been made of some eighty manufacturing establishments in various parts of the State. These inspections were made as a result of complaints as to the killing of fish; to study the processes carried on and wastes produced; to study the efficiency of various forms of treatment now in use; and to discuss with the owners the causes of pollution and possible treatment methods.

From the beginning the Commission has proceeded on the theory that the clearing up of pollution must be a cooperative undertaking between the State and the industries concerned, without the imposition of any unnecessary hardships upon the industries. It is, of course, recognized that in a matter affecting general public welfare, the responsibility for improving conditions must in the last analysis rest upon the industry itself. The State, however, should render every assistance possible. This attitude on the part of the Commission has resulted in the most enthusiastic cooperation being offered by many industries, and it is apparent that if the work can progress from year to year with this spirit of helpful cooperation, the most substantial results can be accomplished.

The policy adopted by the Commission of concentrating its efforts on certain industries until some results have been obtained has limited these investigations fairly closely to two types of plants, milk factories and wood alcohol distilleries.

An intensive study has been made of the wastes from milk factories of all kinds, this industry having been selected as the first to receive attention, as it is the most widely spread of all and some of the wastes produced are very destructive. Many plants and existing treatment works have been given close study by the engineers of the Commission and chemists and biologists engaged for this purpose.

A preliminary study of the effects of milk waste upon life in the streams has been made by Professor Peter W. Claassen of Cornell University, and has yielded results of the most significant character. Under some conditions these wastes are very detrimental to fish life. Under other conditions, however, the decomposition of the waste causes the development of lower types of organisms, which in turn feed higher types further down the stream, and these in turn still higher types, until the waste is finally transformed into large quantities of food for fishes themselves. When these changes go on in small streams that are not themselves fish producing, and thus result in fish food pouring from the small stream into the larger fish producing stream, it is apparent that the net results may possibly be quite as beneficial as in other cases they might be detrimental. This study thus suggested the possibility of so handling milk wastes that their evil effects can be transformed into good. Inasmuch as these wastes are very wide spread, and are found in all parts of the State, the problem of their treatment assumes added importance.

It immediately appeared that extended experimental work on the methods of handling milk wastes would be required. The Commission proposes itself to study the effect of various wastes on fish life, but the determination of how various degrees of purification can be obtained seems a matter in the expense of which the industry itself may justly be asked to share. This was suggested to the New York Milk Conference Board, Inc., the general association of this industry, and that body has undertaken to finance such experimental work to the extent of $10,000 during the next year. The work itself is to be done at the State College of Agriculture, at Ithaca. By devoting this amount to the study of the wastes of a single industry, the Milk Conference Board has thus matched in a single year the entire appropriation of the State for work upon stream pollution, and by doing so is evidencing a cooperative spirit which promises the most important results.

Wood alcohol distilleries have an evil reputation as fish killers. Practically all such plants in this State have been inspected, studied and suggestions made as to how the pollution of the streams can be prevented. It is felt that this situation is well in hand.

On page 56 of this Report, reference is made to the fact that failure of the set of oysters during the last five years has brought about a condition in the oyster business which threatens its practical annihilation in New York waters. The importance of this industry to the people of the State needs no emphasis. Shellfish grounds now leased by the Commission to oyster growers are being given up, with loss of rental to the State, and if the failure of the set continues, there is serious danger that a large part of the $25,000 annual income from this source may be lost. This loss, however, fades into insignificance in comparison with the much greater loss to the oyster industry, and to the consumer, because of the failure of this source of food.

Studies of the effects of pollution upon shellfish have indicated a possibility that the failure of the set of oysters is due to pollution, which destroys the larvæ within a few days after spawning. This subject was investigated to some extent before the war by Captain Wells, under the United States Bureau of Fisheries, in an endeavor to determine the reasons for the failure of the set. Captain Wells is now giving this subject the most careful study, and investigations will be made during the coming summer, which, it is hoped, may throw some light on the situation. This investigation is meeting with the most wholehearted support of the oyster growers. It is a biological problem of the utmost importance, and if the failure of the set is traced to pollution, this single accomplishment will well justify all of the effort involved. The importance of this inquiry will be further discussed under the head of Bureau of Marine Fisheries on page 56.

Systematic Work Necessary. A study of the losses resulting from impairment of the quality of waters — losses to public health, fish life, industry generally, and to the recreational possibilities which pure water courses offer — have clearly demonstrated that systematic work upon pollution should now be given a definite placed in the broad scheme of conservation, and be supported annually by adequate appropriations. The cooperation already developed with industries has further proved that if this work is taken up on a proper basis by the State itself, the industries will not fail to recognize their responsibility, and will themselves attack the problem in a spirit that is certain to yield results in increasing measure year after year. The Commission accordingly recommends that the Legislature make an appropriation of $10,000 for this work for the coming year.

EDUCATIONAL WORK

With a full realization that in the last analysis all conservation is based upon the cooperation of the public, the Commission has given uninterrupted attention to its educational work throughout the past year. This work, whose object is to arouse people at large to a correct conservation view-point, and to mould their minds in conservation matters, consists of as wide dissemination as possible of information relative to conservation and the Conservation Commission, accomplished through the medium of the written word, of the spoken word, and of pictures.

A large number of news articles for the press, and of special illustrated articles for magazines and Sunday editions of the newspapers, have been prepared, every one of which has carried a definite conservation message. The system maintained by the Commission for keeping account of the results of work of this kind shows that its conservation articles were printed and reprinted throughout the State 3,432 times during the year 1919. The extent to which these articles are read is amply proved in the case of those which call for communication with the Commission — a deluge of letters being the usual result of the publication of such an article.

The Commission's illustrated monthly magazine, "The Conservationist," has been published regularly during the year. A special campaign was carried on for the purpose of increasing the number of subscribers, with the result that the subscription roll has been more than doubled.

Wide demand by the newspapers and others for the Commission's monthly statement of "Violations of the Conservation Law," has necessitated an increase in the edition. This publication serves the double purpose of showing just what the Commission is accomplishing along these lines, and also of giving publicity to the names of the law breakers. This, in itself, has been found to have an excellent educational value, as there are doubtless many persons who are deterred from transgressing the law by the knowledge that their names would be spread abroad in the light of day. "This publication is worth five protectors in my district," said a certain sportsman recently, and the same sentiment has been expressed over all parts of the State.

With the close of the war an increased demand for lectures was immediately noticeable. In fact the number of requests for the Commission's lectures is now becoming so great that it is impossible to accede to all invitations. During 1919, 95 lectures have been given in all parts of the State, with a speaker from the Commission. This is an increase of 60 percent over 1918, when 58 lectures were given. As but few lectures are given during the summer months, it will be seen that during the lecture season the actual number delivered averaged more than two a week.

On two occasions it was possible to arrange a series of lectures in one section on successive dates. A motor truck was employed to convey the outfit from one center to another, in this way making possible, in some instances, three lectures in one day. It is also becoming a not uncommon practice for centers in which an evening lecture for grown-ups has been scheduled, to request an afternoon lecture on the same day for children. Occasionally the auditorium of a high school has twice been filled for successive lectures to young people during the afternoon, in advance of a lecture to an adult audience in the evening.

One of the main benefits derived from the lectures is the personal contact of representatives of the Commission with the varied types of audiences that are gathered together at the different centers. The lectures have been given by many different men in the Commission, each man speaking, as far as possible, upon the subjects that come within his own particular sphere. At every such meeting, members of the audience are encouraged to ask questions and to clear up in their own minds matters which may have been a source of misunderstanding. Thus, as a result of a better comprehension of what the Conservation Commission is, and what it is doing, its aims and ideals are spread abroad and a healthy spirit of cooperation is fostered.

At the beginning of the year a system was inaugurated of keeping a record of audiences at each lecture. The total of these figures shows that 21,570 persons were reached at the different lectures. The size of audiences varied from 15 to 1,500, although the average was about 225.

In addition to the lectures that have been given with a speaker, the Commission's films and slides have many times been sent to points within the State, and also to other states, without a speaker. Certain of the conservation films, which were in use in the military camps during the war, have not ceased their usefulness since the war ended, but are now going the rounds of large manufacturing centers and being used in connection with the welfare work of the plants. In one week these films have been shown in factories where as many as 80,000 persons are employed.

Considerable additions to the Commission's file of photographs, motion picture films and slides have been made during the year. An excellent new reel of animal subjects has been prepared which is now being used at many of the lectures. Another new reel of bird life scenes is also proving very popular and instructive. The Commission's stock of pictures is now so comprehensive that when it is necessary to schedule lectures by different speakers on the same evening, there is ample illustrative material at hand, and the necessity for duplication in visiting a center a second time is also obviated.

RECEIPTS AND DISBURSEMENTS

General. Analysis of the receipts and disbursements of the Conservation Commission for the year ending June 30, 1919, shows not only that a new high record was reached in actual cash receipts, but also that the increase in receipts was proportionately only slightly smaller than the increase in operating expenses. This is evidence of greater efficiency and economy in the financial administration of the Commission, without, however, any decrease in the effectiveness of the work. In fact, it has been found possible, as the work has become more highly organized and systematized, to actually accomplish more for each dollar expended than ever before in the history of the Commission, notwithstanding present high prices in every direction.

The receipts for the entire fiscal year were $397,911.80, against receipts for the preceding year of $349,621.75. This is a gain in receipts of $48,290.05.

The disbursements for the fiscal year ending June 30, 1919, were $1,384,602.48, exclusive of the Division of Saratoga Springs. These disbursements, however, included the payment of $474,141.31 out of the Forest Preserve Fund for the purchase of land. Subtracting this latter sum from the total disbursements shows that the net operating expenses of the Commission, exclusive of the Division of Saratoga Springs, for the fiscal year ending June 30, 1919, were $910,461.17. On the same basis, the disbursements of the preceding year, exclusive of payments for the purchase of land out of the Forest Preserve Fund, were $829,449.30.

The net disbursements for operating expenses of the Commission, for the fiscal year ending June 30, 1919, accordingly exceeded those of the preceding year by $81,011.87. The increase in cash receipts turned into the State Treasurer, however, as shown above, was $48,290.05. It is thus evident that the Conservation Commission, with a budget involving more than $900,000, and in a year remarkable for high prices, has cost the State only $32,721.82 more than in the preceding year. The increase in its effectiveness will be apparent in the pages that follow.

Division of Saratoga Springs. The State Reservatic Saratoga Springs, which is excluded from the above figures, a net profit for the year in its income producing departmer $8,152.50, which was an increase over the profits of the year b of $3,317.94. The departments not productive of incon Saratoga expended for general maintenance and operation an extraordinary repairs $66,585.58. This figure does not in an account of the former Reservation Commission, paid by sp authorization of the Legislature, nor construction expenses o new Washington bath house and heating plant, which are pai of Capital Fund, and carried in the inventory, but does in all regular expenses of maintenance and operation of the income producing departments. The expenses of these de ments for the preceding year, figured on the same basis, amou to $58,593.01. The increased expenses of the non-income pr ing departments for the fiscal year ending June 30, 1919, accordingly $7,992.57, which is accounted for by the incr costs of labor and materials of all kinds.

Return on the Investment. When the value of the hatchery and game farm products, and of the trees from the nurseries that are planted upon State land, all amounting to than $300,000, are considered in connection with the a analysis of receipts and disbursements, it is clear that the co vation of natural resources in New York State so nearly pa own way in the actual detailed conduct of the work that it tremendously valuable investment for the people of the State it were possible to fully inventory the value of all of the fish game taken annually, the value of crops saved from destructic the protection of song and insectivorous birds, the value of f saved from fire, and the value of all the other resources that servation increases, there would be shown on the right sic the ledger a balance of many millions of dollars.

DIVISION OF FISH AND GAME

DIVISION OF FISH AND GAME

Llewellyn Legge	*Chief Protector*
John T. McCormick	*Deputy Chief Protecto*
John W. Titcomb	*Fish Culturis*
Mannister C. Worts	*Superintendent of Inland Fisherie*
Emmett B. Hawkins	*Supervisor, Bureau of Marine Fisherie*

DIVISION OF FISH AND GAME

RECEIPTS

The total receipts of the Division of Fish and Game for the fiscal year ending June 30, 1919 were $382,499.51. This is an increase of $53,292.83 over the receipts of a year ago, and is not due to any unusually large fines. When it is considered that throughout the entire first part of the year the country was at war, and during the latter part of the fiscal year conditions had by no means returned to normal, it is felt that a financial increase in this division is very encouraging.

In addition to the cash receipts of the division, the estimated commercial value of fish raised and distributed in the State's fish hatcheries was $221,747.73. The estimated commercial value of eggs and birds distributed from the game farms, and of adult birds retained for breeding stock, was $65,708.50. The value of the hatchery and game farm products, when added to the cash receipts, thus makes a total of $669,955.74. Against this, the Legislature appropriated for the maintenance of the Division of Fish and Game $454,330.00. This division accordingly shows a net profit in cash or its equivalent of $215,625.74.

The receipts in detail are as follows:

Receipts of Division of Fish and Game
Fiscal Year Ending June 30, 1919

Hunting and trapping licenses	$247,873	94
Fines and penalties	63,981	95
Tax and rental on shellfish grounds	28,761	13
Net licenses	26,064	57
Non-resident fishing licenses	8,792	18
Trout tags	1,890	00
Dog licenses	1,235	00
Tagging of game	706	35
Breeder's licenses (Section 372)	635	00
Possession of vension (Section 191)	379	00
Importation licenses (Section 178)	365	00
Sale of skins confiscated	352	75
Propagation licenses (Section 159)	176	00
Fur bearing animal licenses (Section 200)	105	00

Protectors at Revolver Practice Present an Appearance in Their Uniforms that is Clearly Indicative of the Discipline and Efficiency of the Force

Spearing licenses		$58 00
Special protectors' badges		21 00
Rental on trout tagging machines		6 00
Breeders' licenses (Out of State, Sec. 377)		5 00
Miscellaneous receipts		1,091 64
		$382,499 51
Commercial value of pheasants raised and distributed from game farms	$35,318 50	
Commercial value of eggs distributed from game farms	19,390 00	
Commercial value of 2,200 hens raised and kept for breeders	11,000 00	
		65,708 50
Commercial value of fish distributed from fish hatcheries		221,747 73
Total		$669,955 74

GAME PROTECTION

Cases and Recoveries. During the fiscal year ending June 30, 1919, the game protective force prosecuted 3,546 cases of violation of the Conservation Law in relation to fish and game. Of this number there resulted acquittals in but 73 instances. In other words, the protectors succeeded in winning 98 percent of all actions commenced. The excellence of this showing will be more fully appreciated when it is considered that the protectors act as attorneys and conduct the prosecutions in over 95 percent of the cases.

The total recoveries in fines and penalties from these cases were $65,409.75. This differs slightly from the amount turned in to the State Treasurer, because certain fines and penalties have not yet been received from justices. On the basis of 131 game protectors, the number for which provision is made by statute, this is an average recovery of approximately $500 for each protector, and of approximately $19 for each case. These recoveries are approximately sufficient to maintain for the entire year the Bureau of Marine Fisheries, the License Bureau, the three game farms and the Commission's boats and launches.

In the prosecution of these 3,546 cases, there was paid out as costs of court, constables' fees, attorneys' fees, and other miscellaneous charges, the sum of $4,225.45. This shows that it cost the State to prosecute each individual case less than $1.22, or less than 6½ percent of the total recovery.

SIXTY-FOUR SONG BIRDS SEIZED FROM ONE VIOLATOR IN WESTCHESTER COUNTY COST HIM A FINE OF $300.00.

To fully understand the significance of this showing, one must consider the conditions that existed during a large part of the year. For approximately half of the year the country was at war, and people were following other pursuits than hunting and fishing. The number of cases successfully prosecuted, and the amount of recoveries, are accordingly a clear indication of the increased efficiency in the game protective force.

The success of the game protectors is to be attributed in no small degree to the thorough schooling which they receive. Monthly meetings of the division inspectors are held in the Albany office, at which there are thorough discussions of the best methods to pursue in apprehending violators, in obtaining evidence, in conducting trials, and in handling other phases of the work. The division inspectors then hold monthly block meetings in their divisions, at which all of these points are thoroughly gone over with the protectors. By this means, the ability of the game protector is greatly developed, his knowledge of the Conservation Law is strengthened, his ability to try cases increased, and his capacity to devise ways and means to carry on conservation work is broadened.

Analysis of Violations. Analysis of violations of the Conservation law, successfully prosecuted during the fiscal year from July, 1, 1918, to June 30, 1919, shows that the largest recoveries were obtained from cases of violation of the deer law. Two hundred and fifty-seven deer cases were settled, with recoveries of $15,164.95. Most of these cases were obtained by the secret service work of the game protectors in the deer hunting season of 1918, and were settled throughout the year as rapidly as they could be reached. These cases prove conclusively that it is possible to enforce the buck law, provided suitable methods are employed. It is necessary in game protection work, as in any other branch of law enforcement, to beat the violators at their own game. Game law violations are of course conducted as much as possible on the quiet. In other words, the violator's methods are distinctly secret, and if the game protection work is to be effective, the methods of the violator must be matched by secret service methods on the part of the game protectors. The game protectors showed in 1918 that they possess the neces-

A CAR LOAD OF ILLEGAL NETS TAKEN IN ONE RAID ON LAKE CHAMPLAIN.

sary skill to accomplish this work successfully, by rolling up a record of recoveries on deer cases greater than on any other classification of recoveries throughout the entire year.

In view of the fact that the raw fur crop of the State is worth more than two million dollars annually, a record of 324 successful cases for violation of the laws protecting fur bearing animals, with recoveries of $5,340, is particularly gratifying.

Much important work has been done throughout the year in enforcement of the shellfish laws, and in the protection of song and insectivorous birds.

The use or possession of illegal devices resulted in 613 cases, with recoveries of $10,882.25.

Analysis of the principal classes of cases prosecuted throughout the fiscal year are as follows:

Prosecutions and Recoveries

July 1, 1918, to July 30, 1919

Birds:	Cases	Recoveries
Aigrettes	21	$1,005 00
Partridges	9	852 00
Pheasants	70	1,680 50
Geese	6	172 50
Wild ducks	1	11 50
Song birds	21	1,170 50
Robins	5	167 50
Other birds	224	4,394 90
	357	$9,454 40
Quadrupeds:		
Deer	257	$15,164 95
Fur-bearing	324	5,340 00
Beaver	3	183 00
Land turtle	5	54 50
	589	$20,742 45

Fish	375	$6,834 30
Shellfish	422	5,434 60
Illegal Devices	613	10,882 25
Licenses	418	6,867 75

	Number	Value
Nets	254	$5,778 50

Seizures. During the fiscal year the game protectors seized 254 seines, gills, traps, fykes, and scap nets. The commercial value of these nets is estimated at $5,778.50. It is thus apparent that the illegal use of nets is no longer a very profitable business. The nets seized are worth on an average of $23 a piece, whereas in other years they would not have been valued at more than one-half of this figure. In former years the unscrupulous fisherman in many instances would rather take a chance of losing a net than pay the fee required for a license. Now, however, with the cost of materials so high, the danger of losing a net acts as an effective deterrent in many instances. The net license fee has remained practically the same for many years, now being only a small fraction of the value of the nets which they cover. One of the results of the seizure of unlicensed nets has been accordingly to increase the number of licenses issued. During the year 1919, there were 2,524 of these licenses, covering about 8,000 nets. The licenses issued by the Commission have been gradually increasing from year to year, and the number of illegal nets seized has decreased, though it cannot be said proportionately.

Uniforms. The advantage of having the game protective force uniformed has been demonstrated with increased force throughout the entire year. It has increased the *esprit de corps* of the men, and accordingly their effectiveness, and has brought much greater support to the Commission from the great body of law respecting sportsmen. At the same time it has not operated to decrease the effectiveness of the protectors in any respect, since they can readily appear in plain clothes when it is necessary to operate under concealed identity.

The value of the uniforms has been so well demonstrated that the Commission renews its recommendation that the Legislature make an annual appropration to cover their cost. The uniforms are of good quality, and enable the men to present an excellent appearance in court and on all formal occasions, and it is felt that the prestige of the State and the effectiveness of game protection are materially advanced because of them, but only at an increased expenditure on the part of the men themselves. The high prices of all materials and increased living expenses generally will justify the State in providing these uniforms, and if this recommendation is favorably acted upon it will be largely in the nature of a reasonable and necessary salary increase. The Commission believes that the men should be provided with two uniforms, one the regulation uniform now in use, which is suitable for appearance in court, for serving papers, and similar work. They should also be provided with an inexpensive field uniform, which can be worn on patrol work. Protectors are out in all kinds of weather and at all times of the day and night, and to wear a good uniform under these conditions is a very wasteful practice. The effectiveness of the men in dealing with a certain type of violator is, however, much increased if the protector is in uniform. A field uniform of some very durable material, similar

A NET THAT WORKED TERRIBLE EXECUTION IN A TROUT STREAM, UNTIL SEIZED BY PROTECTORS IN A MIDNIGHT RAID.

The Killing and Wounding of Protectors by Violators is Lessened By Increasing the Protectors' Own Skill.

to that used by sportsmen, will be inexpensive, and it can readily be kept in suitable condition.

INCREASED OR DECREASED PROTECTION

The Commission has received during the year the usual number of petitions for additional or decreased protection to different species of game or fish, and has acted favorably upon a number of them. So far as possible, however, no action has been taken upon petitions subsequent to the publication of the game laws. It has been found that after the game laws are published, if increased protection is given to any species, there are almost always many cases of violation of the additional protection order, due to ignorance of the order on the part of the violator. In many cases the violator refers to the published game laws as his source of information. The Commission has accordingly decided that except in extreme cases, where immediate action is necessary, it is inadvisable to issue such orders when they cannot be included in the compilation of the laws.

GAME BREEDING

There has been an increase during the year in the number of licenses issued under Sections 372 and 159, for the breeding of game in captivity, the number issued in 1919 being seven more than the number for the calendar year of 1918. This is in accordance with the well defined tendency, to which attention has been called heretofore, to engage in the propagation of game as a profitable financial undertaking. With the war over, and the country gradually settling down to peaceful pursuits, it is anticipated that game breeding will very materially increase.

CROPS ARE BETTER BECAUSE INSECTIVOROUS BIRDS ARE PROTECTED.

GAME FARMS

The work at the three State game farms has been uniformly successful throughout the past year, in spite of the fact that unfavorable weather at the very beginning of the breeding season set the work back for two or three weeks. A total of 55,400 eggs were distributed for hatching purposes, free of charge, to farmers and sportsmen, and 9,206 half grown birds were distributed for liberation later in the season. In addition, 2,200 pheasant hens were retained on the farms to increase the breeding stock.

In order to pick out the 2,200 hens suitable for breeders, it was necessary to leave the young birds in the rearing fields until they were much more nearly full grown than usual. This meant that there was some reduction in the number of half grown birds sent out to applicants, because of the fact that when the birds approached maturity, they strayed farther, and it was more difficult to catch them up. Those that strayed, however, have stocked the surrounding territory. Moreover, the farms now have a flock of large and very vigorous breeders, raised on a free range, so that they are to all intents and purposes wild birds. Birds raised under the conditions maintained on the game farms are far superior for propagating purposes to birds raised within inclosures, as are many of those ordinarily obtained in the open market.

THE LARGE SCALE OF PRODUCTION OF THE GAME FARMS MAKES PHEASANT SHOOTING POSSIBLE.

The quality of the eggs distributed this year was the best ever produced by the game farms. They were of a uniformly large size and with a good texture of shell. Reports of results obtained by the applicants show that an average of 53 percent of the eggs hatched, and that 63 percent of the young chicks were raised to maturity and liberated. On this basis, about 18,791 birds were hatched and liberated from the 55,400 eggs sent out for distribution during this last season. The Commission considers this a very satisfactory percentage. The same applicants ask for pheasant eggs year after year, and this of itself shows that the work of stocking the covers with this valuable food producing and sport giving bird is being thoroughly successful in localities that are suitable for pheasants.

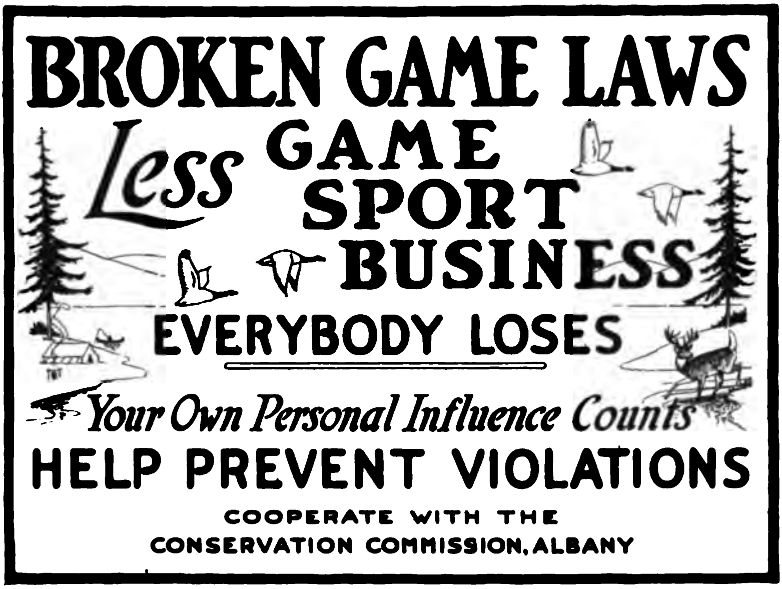
That the pheasant is well adapted to withstand climatic conditions in New York State, wherever a sufficient amount of food can be obtained, was well illustrated at the game farms in March. Stock birds were placed in the breeding pens about March 15, and the following week one of the most severe snow storms of the season occurred. The breeding pens, which are six feet high, were drifted nearly full of snow, some of them being almost entirely covered. Many of the birds were under the snow three or four days before the men were able to dig them out, but all were apparently in excellent condition when they were uncovered.

It seems apparent that the game farms have now been developed to approximately their maximum capacity with their present size, and that any effort to produce more birds will necessarily have to be based on either larger farms or more farms.

The number of birds that can be produced on a given area is limited by several factors. In the first place, the birds have to find a considerable amount of insect food if they are to remain healthy, and this means that they must not be overcrowded. Moreover, if the same area is used intensively for more than two successive years, unsanitary conditions will be created, which will result in epidemics of disease. There can be no doubt that the freedom of the New York State game farms from serious epidemics has been largely due to recognition of this necessity. The practice on the New York farms is to use about one-half of a farm for two years for rearing fields, while the other half is being plowed, cultivated, and used for the production of necessary crops. This cultivation of the land renovates it, and by the end of the two year period it can be safely utilized for rearing fields, while the other half of the farm is undergoing renovation by crop production.

CAMPAIGN AGAINST VERMIN

The campaign against vermin, begun by the Commission a year ago, has been continued throughout the year with very gratifying results. Every hunting license during this last year bore an appeal to sportsmen to enlist in the campaign to destroy the enemies of useful wild life. The game protectors have been equipped with small caliber rifles, and they report the destruction of 2,887 animals and birds of eighteen different species, all recognized as enemies of the more valuable wild life. While this number is not of itself particularly significant, except as it indicates the activity of the game protective force, it nevertheless furnishes a valuable object lesson to all of the sportsmen of the State. There can be no doubt that the total number of enemies of valuable wild life killed throughout the entire State during the year is very large and helps materially in keeping the predatory species in check.



THE SPORTSMAN NOW READS THE GOSPEL OF PROTECTION IN EVERY PART OF THE STATE.

On account of the great destruction caused by crows to birds, poultry, and agricultural crops, the Commission experimented during the year with poisoned corn. The corn was soaked in a solution which will kill crows, but is not injurious to birds or poultry. Crows have no crops, whereas other birds have, and the poison will not injure the birds with crops. The method was found very successful, and it now appears possible to readily decrease the numbers of crows in places where this seem desirable.

Since the initiation of its campaign against vermin, the Commission has been severely criticized in certain quarters for thi work. The critics have stated that the State can ill afford t exterminate any of the species against which it is making warfare. It should be understood, however, that no campaign o extermination is being waged against any of these species, th work being designed simply as a control of their numbers. Ever hunter in the State is a limiting factor for the more desirabl species, and with more than one-quarter of a million hunters, al pursuing the more desirable birds and animals, it is remarkabl that they are able to survive at all. Until the campaign agains vermin was launched, however, there was practically no chec in any quarter upon increase of the predatory species, which pre upon the more desirable wild life. It is surely the part of wisdom to place some check upon the more undesirable forms of wil life, though no lover of nature would ever wish to see the entirely exterminated. The Commission's campaign against vermin should accordingly be considered solely as a control measure and not as an attempt at extermination.

BIOLOGICAL INVESTIGATIONS

Biological investigations have been continued throughout the year, with weekly reports from game protectors on the wild lif observed, and special reports from time to time as need arose. The purpose of these investigations, which have heretofore bee discussed under the name of the "game census," is two-fold. They are designed to give accurate information regarding th condition of wild life from time to time, in order that wise law may be enacted. They are also designed to show the importan place which wild life holds in the economy of the State, and thu are investigations in economic biology, underlying the fullest possible use of the State's wild life resources. This entire work is of so much importance, and so much valuable information can be drawn from it, that the Commission recommends definit appropriation for a naturalist or biologist to devote his entire time to the study of the wild life over which the Commission has jurisdiction, and regarding which it must constantly have the most dependable information.

Reports from Hunters on Game Killed. When hunters took out their hunting licenses in 1919, they were required to report on the back of the stub the game taken by them under their hunting licenses in 1918. When taking out licenses in 1920, they will make similar reports for the year 1919. The form of the 1920 licenses, however, has been simplified, and all of the information required will be given on the face of the stub. It is accordingly anticipated that the information regarding game killed will be much more dependable next year, and that the reliability of this information will steadily increase, as its value becomes more apparent to the hunters themselves. The Commission feels that that given on the 1919 licenses, covering the season of 1918, is not fully complete. Aside from its incompleteness, however, due to the fact that sportsmen were unprepared for making reports, it is entirely dependable, and furnishes the first reliable indication that the State has ever had of the great economic value of its wild life. It will take some time to compile all of the data on the license stubs. That for Washington County, however, has already been tabulated, and it shows that the sportsmen of that county took, mostly within the county, in the year 1918, the following game:

A Good Coon and a Good Coon Dog — What More Does Any Sportsman Want!

Game Taken in Washington County in 1918

Deer	87
Cottontail rabbits	3,224
Snowshoe rabbits	176
Gray squirrels	1,996
Black squirrels	35
Fox squirrels	115
Skunks	2,345
Mink	88
Otters	3
Muskrats	5,303
Raccoons	274
Red foxes	434
Gray Foxes	8
Bob cats	1
Grouse or partridge	648
Pheasants	50
Quail	5
Woodcock	173
Wilson snipe or Jacksnipe	69
Ducks	227
Rails	8
Coots	15

This is a total of 15,284 animals and birds killed. The number of licenses issued was 2,354, which shows that the average number of birds or animals taken by each hunter was approximately six and one-half.

On the basis of conservative prices, the value of this game was $34,946.00, which is approximately 1400 percent greater than the amount of money paid to the State for the licenses under which the game was taken. It is thus clearly apparent that the State's system of game protection is thoroughly sound as an economic policy.

Ruffed Grouse. Reports from game protectors show that in practically every part of the State the nesting season for ruffed grouse was far more favorable last spring than for many years. From practically all sections, reports of the increase of the grouse led to the belief that the birds are surely coming back, and that under proper protection they may even regain their former abundance in localities that are still favorable for them. The Commission attributes this not only to a better nesting season, but also to the fact that the shortage of snow-shoe rabbits in the far north has passed, and the large numbers of predatory birds that swept down from the north a few years ago in search of food have now gone back. If it is true, as the evidence seems to clearly indicate, that the shortage of grouse is largely attributable to an influx of goshawks and great horned owls from the north, on account of the periodic rabbit shortage, we may expect to have another grouse shortage in from seven to ten years. When the increase in the number of predatory birds comes at the same time with very cold nesting seasons, the grouse will be reduced to a very low ebb. It is now confidently believed, however, that with a short season of one month, and with a small bag limit, a reasonable amount of grouse hunting can be permitted each year, without danger of extermination.

Deer. A change in the law regarding deer, which permitted the killing of both bucks and does during the season of 1919, made accurate information regarding the results of the deer hunting season particularly important. The Commission accordingly used every means possible to collect accurate data regarding the results of the season.

Investigations made by the Conservation Commission for the last four years, particularly when the snow was deep and the deer were yarded, so that it was possible to estimate their numbers, have indicated that the deer population of the State in round numbers prior to the last hunting season was approximately 50,000.

Reports of game protectors regarding the number of men who hunted deer in their territories during the season of 1919 totaled 60,458. This is an estimate based upon information collected from guides, hotels, boarding house keepers, etc. It may thus be stated with reasonable accuracy and in round numbers that approximately 60,000 men hunted deer during the last season. In 1917 the reports totaled only 37,000. It is thus apparent that in 1919 there were actually more men hunting deer than there were deer in the State. This is partly attributable to the fact that does could be killed, which made it much more possible for a hunter to get a deer. It is also partly attributable to the great increase of the vacation spirit, which has become an important feature of modern life, particularly since the war ended. It is evident that this increase in the number of hunters makes it necessary to increase the restrictions on hunting if we are to preserve the game.

During the deer hunting season every game protector and forest ranger was required to report every dead deer actually seen and every deer directly reported to him as having been shot, and to specify the sex. The Commission has reports from eighty men, and their actual observations of dead deer and deer directly reported to them as shot, over the entire extent of the Adirondack deer hunting territory, show 5,627 does and 4,345 bucks.

SIXTY THOUSAND MEN WERE CALLED TO THE WILD IN THE DEER SEASON OF 1919.

Another method of ascertaining the does and bucks shot was that of requiring protectors to take up positions on different days on important roads leading out of the Adirondacks, and make an actual count of the deer that passed on those days. The protector at Saranac Lake on eleven days reported 26 bucks and 62 does. At Tupper Lake the proportion was even greater, the protector on five days reporting a total of 63 bucks to 215 does, or 3.4 does to one buck.

All of this data makes it clearly apparent that the statements of those in favor of a change in the law last year, that whereever possible hunters would get bucks, and that the mortality of the does would be comparatively small, were without foundation, the real result of permitting the killing of does being a tremendous mortality of the mothers.

Figures showing the total kill of the season will not be available until reports are received from tanners, showing the number of Adirondack deer hides received during this fur buying season. The following general conclusions, however, may be stated at this time:

1. The number of bucks killed has exceeded the number of bucks taken in a buck law year. The new law has thus not operated to protect the bucks.
2. The number of does taken has been very much in excess of the number of bucks.

The Commission believes that when the final figures are available, they will indicate that considerably more than 20,000 deer have been killed during the season of 1919. In the season of 1917, when approximately 37,000 men hunted deer, the final figures indicated a kill of between 8,000 and 10,000. These figures have all been compiled on a basis which makes them thoroughly conservative.

In the State of Vermont in 1919, as a result of a law permitting the killing of does in that year, the kill was 2,138 does and 2,018 bucks, whereas in the nine days' hunting season in 1917, under the buck law, 992 deer were killed, and in the eighteen days of hunting in 1916, under the buck law, 1,630 deer were killed. Vermont has permitted the killing of does about once every five or six years for some time, and on each occasion, the number of bucks killed has exceeded the number in a buck law year, the number of does killed has exceeded the number of bucks, and the total kill has been more than double. The Vermont law requires hunters to exhibit the heads of their deer to a game protector, and the statistics thus obtained are thoroughly dependable.

When it is considered that Vermont with its small population and small territory, and very few hunters coming from large centers of population or from outside the State, killed 4,156 deer in only five days, it is apparent that New York, with a month and a half of hunting and 60,000 hunters, and without enforceable restrictions of any sort, has made a very severe inroad upon its deer population.

The Conservation Commission has very carefully investigated every hunting accident which occurred anywhere in the State during the entire hunting season of 1919. These investigations have been made by the game protectors and forest rangers in the deer hunting territory. Nine men were killed *in mistake for deer,* and seven men were wounded *in mistake for deer.* In every instance, the man who did the shooting thought that he saw a deer, and inasmuch as he was not required to look close enough to see horns on the deer, he shot and either killed or wounded a fellow hunter. One father killed his son; another father wounded his son; one man killed his brother-in-law; and several other men either killed or wounded members of their own hunting parties.

A year ago only two men were killed and two wounded in mistake for deer, and in each one of those four cases the man who did the shooting admitted that he was not endeavoring to observe the buck law. This year, when no one was required to observe such a law, the killings and woundings increased from four to sixteen.

Records of hunting accidents in state after state, where the buck law has been tried, have proved conclusively that the buck law, requiring hunters to look for horns on the deer, safeguards human life, and that the mortality jumps tremendously when the buck law is not in force. The results of the last season in New York State have proved it again.

Reports received from game protectors on the number of deer and deer tracks seen in the woods since the close of the season, and particularly since snow fell, have indicated that there are still deer enough left in the woods for a breeding stock, and that reasonable hunting can still be permitted.

THE MOTTLED COAT OF FAWNS IS LIKE SUNLIGHT ON DEAD LEAVES — NATURE'S PROTECTIVE COLORING.

It has been thoroughly proved by biologists that under the buck law a considerable number of deer can be killed and the herd will nevertheless continue to increase. This is because of the fact that deer are very polygamous. A ratio of one buck to four does is sufficient to insure full reproduction.

The Conservation Commission accordingly favors a return to the buck law, but with the added restriction that the hunter may shoot only one buck, and with a further restriction that all deer transported must have the head attached, and that the evidence of sex shall not be removed from hides, except in the actual process of tanning. The restriction of requiring attachment of heads to carcasses during transportation will make it impossible for hunters to kill does, cut them up, and bring them out in pack baskets. Under the old buck law, large numbers of does were brought out in pack baskets, and the secret service work of the game protectors proved that many hunters killed does quite as readily as they did bucks, simply because they could bring them out so easily without detection. If bringing them out in this way is impossible, their killing will very largely cease.

The Commission also advocates a short season from October 15 to November 15. It does not favor making the season shorter than this because a much shorter season would mean concentration of a large number of hunters in the woods at one time, which would have a tendency to increase hunting accidents.

A close season ought not to be resorted to unless absolutely necessary. The people of the State should not have their recreation curtailed any more than necessary. Quite as important as this is the fact that large numbers of people in the Adirondacks derive a considerable part of their annual income from caring for hunters, and to entirely prohibit deer hunting for a period of years would be a severe hardship to them. The Commission is convinced that there are still enough deer left in the Adirondacks to make this unnecessary.

Beaver. Rapid increase in numbers of beaver in the Adirondacks within recent years has focussed public attention on these interesting but destructive animals. It has been apparent for some time that considerable damage was being done by the beaver through the flooding and consequent killing of timber by their dams. They have frequently flooded public highways and even railroads. While the trees actually felled by the beaver for food and dam building are many in number, their relative value is small, because they are usually of small size and inferior species. The substantial damage is accordingly in the flooded areas.

In order to secure some accurate facts in regard to the beaver damage in the Adirondacks, instructions were sent by the Division of Land and Forests to the forest rangers in August to report in detail on all dams in their respective districts. There was not enough time to enable the men to cover their territory closely enough to examine every dam; therefore, the reports are incomplete, and probably not over 50 percent of the total number of dams was covered. A summary of the rangers' reports is presented in the accompanying table.

The 587 dams reported upon flooded an area of 8,681 acres, upon which there was timber worth $51,425. Two-thirds of the acreage flooded was State land, upon which stood seven-eighths of the total timber damaged.

Acres of Drowned Trees Prove That the Busy Beaver is No Respecter of Valuable Timber.

Some of the dams are comparatively new and the timber on the flooded areas has not all been killed, and in these cases the ranger had authority to destroy the dams immediately. It is estimated that $5,530 worth of timber could be saved by immediate and permanent removal of some of the dams. The difficulty is that the beaver will usually rebuild or repair a dam the first night after it is destroyed.

The figures given above show that for every beaver dam built, some one has to pay $90. Moreover, it is difficult to place an

SUMMARY OF RANGERS' REPORTS ON BEAVER DAMS

November, 1919

COUNTY	PRIVATE LAND				STATE LAND				Average age of dam (years)
	Number of dams	Area flooded (acres)	Value of timber flooded	Possible salvage of timber by destroying dams at once	Number of dams	Area flooded (acres)	Value of timber flooded	Possible salvage of timber by destroying dams at once	
Clinton	....	....	....	....	....	....	....	....	....
Essex	22	170	$75 00	....	19	81	$700 00	....	3
Franklin	2	....	....	....	4	2	....	....	1
Fulton	2	1	....	....	1	4	....	....	1
Hamilton	94	1,879	4,707 00	$2,895 00	269	4,637	37,758 00	$825 00	5
Herkimer	24	199	990 00	500 00	103	880	6,935 00	1,245 00	4
Lewis	10	77	50 00	50 00	1	4	....	....	*
Oneida	3	175	....	....	....	....	....	....	1
St. Lawrence	16	272	125 00	15 00	5	62	85 00	....	2
Saratoga	3	65	....	....	....	....	....	....	*
Warren	1	1	....	....	8	172	....	....	2
Washington	....	....	....	....	....	....	....	....	....
Summary	177	2,839	$5,947 00	$3,460 00	410	5,842	$45,478 00	$2,070 00	4

Total number of dams reported	587	
Total area flooded	8,681	
Total value of timber flooded	$51,425,	an average of ninety dollars per dam
Possible salvage of timber	$5,530	

* Less than 1 year.

intrinsic value on damage done to scenery. Dams are frequently built at the outlets of lakes or ponds surrounded with beautiful forest. When the water level of the pond is raised by the dams, the timber around the shore line is killed. The result is a fringe of dead trees around the water's edge, in place of the natural green foliage. Great damage has been done to improvements such as roads, docks, boat-houses, cottages etc., that have been constructed on privately owned land.

A few years ago the beaver was apparently extinct in the Adirondacks. In 1905 a few pairs were liberated in northern Hamilton and Herkimer Counties. The table accompanying this report indicates how the animals have increased and spread from these points as a center. The average age of dams reported in Hamilton County is five years; in Herkimer County it is four years. The beaver have plied their trade in northern and western Essex County for three years; in St. Lawrence and Warren Counties for two years; while in the outer portions of the Adirondacks they have been working for only a year or so.

BEAVER HAVE FLOODED AND KILLED MUCH OF THE SHORE LINE OF EIGHTH LAKE.

Something must be done to prevent such large and wide spread damage. Probably the removal of protection on beaver for a short open season will prove the most effective means of solving the problem.

HUNTING LICENSE FEES

The Legislature at its last session passed a bill to amend the hunting license law by increasing the fee allowed to town and county clerks to twenty-five cents. This made the hunting license cost $1.25, instead of $1.10. The bill, however, was vetoed by the Governor, with a memorandum stating in substance that, inasmuch as no new duties had been imposed upon the town and county clerks, the increase was unnecessary.

The Commission feels that the facts of the case were not clearly understood, and accordingly recommends again that the law be amended to allow town and county clerks a fee of twenty-five cents, on the ground that their duties have actually been increased, and that the greater expense of conducting their offices makes such an increase thoroughly justifiable, and in line with the increased costs in every other field. The Commission has received many requests from town and county clerks for such an increase, and thoroughly endorses them.

When the fee of $1.10 was established, the clerks were required to issue hunting license only, without a button. They are now required to handle buttons, which are bulky, and very materially increase their labors. The requirements that hunters wear buttons has resulted in a decrease in hunting license violations, and a corresponding increase of thousands of dollars in the annual receipts of the Commission.

In applying for licenses, applicants are now required to state the game that they took under their licenses of the preceding year, and this entails additional work on the part of the clerks, both in explaining the method of answering questions regarding game taken, and in actually filling in the application in many instances. The information obtained by the Commission in this way is of tremendous importance in keeping a check upon the State's wild life resources. It shows that the value of game taken in the State each year runs into millions of dollars, and as a basis for wise game legislation is well worth all the trouble involved.

The town and county clerks have pointed out that the labor and care necessary to properly handle the hunting license is much greater than that required for other work that is better compensated. This is particularly true in the case of licenses that are sent by mail, when the applicant does not appear personally. In such cases the clerk frequently disburses more money, in stamps and stationery, than the ten cent fee that he receives, and uses his time besides. Even when the applicant appears in person, the fee is insufficient to cover the time and cost of issuance, of making returns to the Commission, of returning stubs, of distributing digests of the Conservation Law, of obtaining new buttons for applicants who have lost theirs, and of answering the really considerable volume of correspondence that is naturally addressed to them because they issue the licenses.

Because of all of the reasons here given, the Commission recommends that the hunting license law be amended to increase the fee to $1.25, of which the clerks may retain twenty-five cents for their own fee.

BUREAU OF MARINE FISHERIES

Receipts. The receipts of the Bureau of Marine Fisheries for the fiscal year ending June 30, 1919, were $29,467.48. This is an increase of $5,719.78 over the receipts of the preceding year.

Surveys. The State boats "Rednav" and "Shellfish" have been in continuous commission during the entire season, performing the necessary work assigned to the Bureau, making surveys, and repairing and erecting new signals throughout a greater portion of the marine district. They have also made a great many examinations of the shellfish conditions in Long Island Sound, Raritan Bay, Hudson River and other waters in the marine district.

During the last year, a new section, Staten Island Sound, was opened for shellfish cultivation and leases granted for thirteen lots, embracing an area of five hundred ninety-two and one-tenth (592.1) acres. In order to locate these lands, a triangulation net was run, extending from Ward's Point to Linoleumville, Staten Island, a distance of nine miles. It resulted in the recovery of many of the old United States Coast and Geodetic Survey triangulation stations, and of the monuments set in 1889 by the "Joint Boundary Commission to Determine the Boundary Line between the States of New York and New Jersey in Lands Under Water in Staten Island Sound and the Hudson River." At each of the old points recovered, a description was made and new references measured, so as to facilitate the recovery of the points at any future date. As the lands under water in Staten Island Sound are divided equally between the States of New York and New Jersey, it was necessary to exercise care to insure that all the lands were within New York State. In one case it was found that the State of New Jersey had granted a lease of grounds of which five and four-tenths acres extended into New York State jurisdiction.

Some survey work that would otherwise have been done was abandoned because of the failure of the set of oysters, in the belief that for at least sometime to come, if not permanently, the demand for shellfish grounds will be less.

The geographical positions of certain triangulation stations and other positions within the marine district were furnished to the United States Coast and Geodetic Survey and to the Navy Department from time to time, as requested.

The large surveying tower at Great Kills was blown down in the heavy storm of March 29, 1919. This is one of the most important signal towers and should be replaced at the very earliest date, as no surveys can be made in this locality until a new tower is erected. Several other smaller signals and tripods are down in this locality and in Long Island Sound, and must also be repaired before proper surveys can be made.

Chemical and Bacteriological Tests. The Commission is greatly indebted to Dr. P. B. Parsons, the Federal Bacteriologist of the United States Department of Agriculture, upon whom it relies to furnish it with data and analyses and inspections of the shellfish grounds, and upon whose reports the Commission bases its decisions to issue certificates of inspection that the products of the shellfish grounds described are fit for use as food.

Cooperation with the Bureau of Chemistry of the United States Department of Agriculture was continued and frequent inspections and examinations of shellfish were made in the following areas: Great South Bay, Jamaica Bay, Cold Spring Harbor, Hempstead Harbor, Manhasset Bay, Port Jefferson Harbor, Great Peconic Bay, Shelter Island Sound, Gardiner's Bay, Huntington Bay, Northport Harbor, Raritan Bay and Staten Island Sound. Examination was also made of the soft shell clams in Setauket Harbor, Long Island, following information that the clams in this bay showed a green discoloration, at first believed to be due to the presence of chemicals. The report of the bacteriologist disclosed the fact that the color of the Setauket clams was due, not to the presence of chemicals, but rather to the absence of all impurities of any kind. A similar case occurred in the State of Maryland, where it was found that the color of the algae, or vegetable growths, in the water was absorbed by the oysters nearby. Algae grows only where the waters are pure, and tide and current actions of small extent, and in some European sections green gilled oysters are preferred to any other kind.

The cooperation of the Bureau of Chemistry insures a uniform regulation for the sale of shellfish by both the National and New York State governments, and a material saving of expense to both departments, as facilities for collecting the samples, boat, dredges, etc. are furnished by New York State, and the bacteriological examinations are made by the Bureau of Chemistry. All requests for examination are promptly responded to and copies of the bacteriological results furnished to the Bureau of Marine Fisheries.

Acreage under Lease and Franchise. The State shellfish grounds under lease and franchise at the close of the year amounted to 24,075.8 acres. In 1915 the acreage was 33,956. There has accordingly been a loss of approximately 9,880 acres, or 29 per-cent, this loss being almost entirely due to the failure of the set. The statistics of franchises and leases for the year are given in the following table:

Franchises and Leases of Shellfish Grounds

1919

	Covering acres
17 franchises surrendered to New York State....	1,232.6
14 leases assigned to New York State............	1,110.9
12 leases expired during year..................	358.6
Acreage surrendered	2,702.1
12 leases were renewed........................	358.6
13 new leases were granted....................	571.9
Acreage leased	930.5
233 leases are in force.......................	11,737.8
605 franchises are in force....................	12,338.0
Total acreage under lease and franchise......	24,075.8

Decline of the Oyster Industry. For the last five years there has been a failure of the " set " of oysters in those waters from which the seed oysters for New York State shellfish grounds are obtained. The cause of the failure of the set is not fully known, but much of the information already obtained, as a result of biological investigations, indicates the probability that it may be largely due to a rapid increase in the amount of pollution in waters where the eggs normally hatch.

Oysters spawn in the summer. The oyster larvæ when thrown off by the parent oyster are microscopical in size. They are thrown off by millions, and for about three weeks float about, on or near the surface of the water. After this stage of their development, they sink to the bottom and attach themselves to shells or other smooth objects. This sinking to the bottom and attaching to shells is called " setting." It is obvious that if the industry is to be conducted on a large scale, the set must be very large and very concentrated. These two conditions are met by the oyster growers by the dumping of large quantites of old shells in places suitable for the setting of large numbers of oysters, and where the embryos will not be readily carried away by tidal currents before they have time to set.

The chief places where it has been found feasible in recent years to obtain a set of oysters of commercially profitable proportions, in waters tributary to the New York shellfish grounds, are at the mouths of the rivers entering Long Island Sound from Connecticut. There are some setting grounds in New York State, but they are of secondary importance and are fast becoming valueless on account of pollution. For years practically the entire oyster industry of New York has accordingly relied for its set upon the harbors of Connecticut.

After the young oysters have set and reached a sufficient stage of development, the practice has been to dredge them up, and transplant them to certain New York waters, where more rapid growth can be obtained. The advantages of various places have been carefully studied, and frequently oysters are moved several times in the course of their life history, for the purpose of developing size or other desirable characteristics. In short, it may be said that the growth or cultivation of oysters has been developed to a high state of perfection. The success of the industry, however, depends in the first instance upon the success of the set in Connecticut waters, and for the last five years this has failed.

Investigations made by the United States Bureau of Fisheries, through Captain William Firth Wells, who is now biologist and sanitarian of this Commission, have shown that the spawn from adult oysters in the mouths of the rivers of Connecticut have not reached the age preparatory to setting. It is thus apparent that something has happened at the first stage in the life of the young oyster to bring about its destruction.

Within the last few years, due largely to the stimulation of the war, there has been a tremendous development of industry along the banks of the rivers flowing into Long Island Sound, and this has meant a very material increase in the amount of trade waste which those rivers carry. It is thus quite possible that the failure of the set of oysters may be due to pollution of those rivers by trade waste. The oyster larvæ may be killed directly by chemical substances in the water. Inasmuch as the larvæ are microscopic in size, and accordingly must feed upon aquatic organisms even smaller than themselves, it is also quite possible that their natural food may be destroyed in the rivers and bays by trade wastes which would not of themselves destroy the larvæ.

The States of Connecticut and Rhode Island are thoroughly alive to the menace which this situation holds, and have appointed commissions to make a thorough investigation and take remedial steps. It is the intention of the Conservation Commission to cooperate in every way possible in solving this problem, in order to conserve if possible the tremendously valuable shellfish industry in this State.

In the last ten years, the Conservation Commission has received from rentals and taxes from shellfish grounds more than a quarter of a million dollars. This is an income which the State can ill afford to lose. The loss to the people of the State, however, if they should be deprived of this source of food, would be immeasurably greater. To be sure, the set of oysters has not failed in states farther south. It is certain, however, that, if the failure of the set in Long Island Sound is due to pollution, the time may surely come when the set may fail in still other states for the same reasons. It accordingly behooves New York State and every other state concerned, as well as the National Government, to attack the entire problem vigorously all along the line, and before it is too late. The oyster industry of the entire Atlantic Coast is more valuable, from the standpoint of investment and the value of the product, than any other single branch of the fishery industry.

As a result of the failure of the set, the oyster industry is to-day going through a period of profound re-organization. A large number of concerns have gone out of business, while others have been holding land with the desperate hope that the set would again return. Each year has added to the conviction that conditions are becoming such that the old methods will never sustain the industry in its former position. With this conviction, the present growers are divided into two classes. First, there are those growers who one by one are dropping out because of the continued failures. Second, there are those who, looking to the future, believe that the field for oyster culture in the north is going to change, and who are preparing for what they consider will be the future of the oyster business. The former class cannot be interested very deeply in changed methods, because their all has been staked upon former methods, and they have determined to go out of business upon the failure of these methods. The second class look forward to the time when the oyster industry of the North will be limited to supplying oysters in the shell, in comparatively small quantities, with oysters in "bulk," out of the shell, coming from the South.

The time is favorable for liquidation, and both parties are realizing on their assets, the first going out of business, and the second adjusting their business for the future.

From the standpoint of the State, the problem is clearly one of maintaining such a condition of oyster culture as will continue this important source of food supply, and also cause the State oyster grounds to continue to pay rent. The following table shows that the amount of oyster grounds rented has fallen rapidly during the past five years. The revenues also have decreased, although not so much as the reduced acreage under cultivation. The acreage has fallen almost 30 percent, while the average rentals for the years 1918 and 1919 were over $7,500 less than the average during 1916 and 1917.

Statistics Showing Growth and Decline of Oyster Industry

Year ending	Acreage	Rentals
October 1904	30,000	$1,069.22
" 1905	30,000	2,059.81
" 1906	33,943	3,191.76
" 1907	30,269	1,932.13
" 1908	33,035	5,683.33
" 1909	33,374	14,726.84
" 1910	......	23,137.52
" 1911	31,328	20,583.90
" 1912	31,563	21,881.82
" 1913	31,665	24,093.02

Year ending	Acreage	Rentals
October 1914	31,645	$30,694.46
" 1915	33,956	26,288.76
July 1916	29,611	31,547.31
" 1917	27,188	31,176.98
" 1918	25,847	21,660.20
" 1919	24,076	25,556.80

Average rentals for 1916–1917	$31,362.15
Average rentals for 1918–1919	23,663.50
Loss	$7,697.65

This is not a measure of the total decline in the industry, however, for the State of Rhode Island has lost 60 percent of her revenues, and the grounds cultivated there are less than 50 percent of what they were in 1912. The State of Connecticut also has been forced to reduce the assessed value of the beds in order to encourage growers to hold on to beds at a financial loss. New York State, because the grounds are mostly those on which oysters are matured, and also because of the reasonable rentals, has not suffered so severely as the other states. Any available figures showing the decreases in the quantity of oysters produced are not very reliable, but it is certain that the quantity is considerably less than 50 percent of what it was from five to ten years ago. Statements from the Supervisor of the Marine District show a much larger decrease than this, and there can be no doubt that there has been a tendency to hold grounds which have not been as productive as formerly. This means that the shrinkage in the acreage under cultivation will probably be very acute when the industry at large finally decides that it is impossible to hold land for which it can obtain no seed and, therefore, no return.

It is clear that it is to the advantage of the State to encourage the industry to continue to hold the grounds and, if possible, to stimulate the production of seed oysters. Before the State allows an industry, in which the State itself has such an interest, to fail, it should carefully consider if anything can be done to bring about a return to normal conditions.

There are definite reasons to hope that considerable improvement in the method of collecting set can be devised by technical investigation. Whether the failure is due to pollution, direct or indirect, or to other causes, there is little doubt that remedies can be found which will cause a return to natural conditions and the former prosperty of the industry. Perhaps such studies will develop artificial methods of propagation similar to those in use in France. Perhaps a method may be developed based on the results of experiments which have been conducted by the United States Bureau of Fisheries.

Whereas oysters were once plentiful, and were food for the common people, the present conditions are forcing them gradually to become classed as luxuries. With a further depletion of the natural growing areas, the food will be further removed from the people, and oysters will become a delicacy. In the hope that the decline of the industry may be checked, the Commission is considering the advisability of trying to develop methods of collecting set. Experiments conducted within the last few years have yielded results which suggest very strongly the possibility that a complete solution of the difficulty may yet be found.

BUREAU OF INLAND FISHERIES

The receipts of the Bureau of Inland Fisheries for the fiscal year ending June 30, 1919 were $26,122.57. This is an increase of $3,928.87 over the preceding year, and is due to a number of causes. The high price of food of every sort has made it more profitable for commercial fishermen to take the coarse food fish of the inland waters, and these fish are now filling a more important place in the food of the State than ever before. This is undoubtedly the most important reason for the increase in the receipts from nets and set lines. The activity of the game protective force, however, has had marked influence in decreasing the use of unlicensed nets, and in inducing those who formerly violated the law to apply to the Commission for licenses.

It is a policy of the Commission to permit the taking of coarse fish to the fullest possible extent without danger to the more important varieties. The necessity for such a policy will be more fully appreciated when it is considered that fifty years ago the population of the United States approximated ten million, whereas today the State of New York alone contains ten million people, while the population of the entire United States has increased to approximately one hundred million. This makes it necessary to draw to the utmost upon every available source of food supply. Not to do so would be short sighted in the extreme. The Commission accordingly, through its Bureau of Fish Culture, propagates the more desirable fish for planting in public waters. Through the Bureau of Inland Fisheries it permits the taking of food-fish and coarse fish by nets and set lines, under restrictions which will safeguard the supply. And finally, through the game protective force, it enforces the laws and regulations and keeps abuses down to the lowest point possible with the protectors available.

It was pointed out in the last Annual Report that during the war the Commission had removed many restrictions regarding netting, in order that the greatest possible use might be made of the fresh water food resources during the food shortage. Following the close of the war, the Commission felt that in many instances these restrictions should again be put into operation, in order that the permanent supply of fish from certain waters might not be impaired. In certain other cases, however, it has been felt that a return to former restrictions was unnecessary.

Reports of licensed fishermen for the year 1918 show that a total of 6,381,970 pounds of fish were taken with nets, set lines, traps and eel weirs licensed by the Commission, and that the total value of these fish was $600,906.32. Both the number of pounds taken and the value constitute a new high record. It is worthy of notice that the ciscos, or green-backed herring, taken from Lakes Erie and Ontario, amounted to 3,774,295 pounds, or more than half of the total number of fish taken in licensed nets. It is this important fishery which the new hatchery at Dunkirk is designed to keep up by intensive stocking.

The fishing industry of Lake Erie and Lake Ontario has grown to large proportions, and much money has been invested in equipment. While the New York State shore line in Lake Erie is much less than that of Pennsylvania or Ohio, it is nevertheless true that the ciscos taken in New York waters compare very favorably in quantity with both of the other States. There is a bond of interest between New York, Pennsylvania, Ohio and the Dominion of Canada in these lakes, which is clearly recognized by all parties, and all of them are taking active steps to maintain the fisheries of those lakes at the highest possible level.

The Burbot Fishery. During the last three years net fishermen of the Great Lakes have set their gill nets during the summer months in deep water, where they could take the burbot, sometimes called the ling, or lawyer. The burbot is very destructive to whitefish and lake trout, and its taking in considerable numbers will be of great advantage to the other fisheries. Heretofore it has not found a ready market. As a result of the efforts of the Bureau of Fisheries to popularize it, however, it has come to find a definite place, which it will undoubtedly maintain. In 1918 the licensed fishermen reported the taking of 43,131 pounds.

Set Lines. One of the most popular methods of taking coarse fish has been by set lines. The granting of licenses for set lines was begun in 1915, and in that year approximately 2,000 were licensed. In 1918 the number had increased to 5,000. Only certain of the coarse fish are permitted to be taken on these lines, and the lines are not permitted to be baited with minnows. Because of these restrictions, the game protectors report that they are not doing any damage to the more valuable species. The set lines meet the needs of farmers and others who have no time to spend in fishing with hook and line, since the line may be set and left in the water overnight with a reasonable chance that a fair supply of fish will be obtained for table use.

Shad Fishing. Statistics recently available prove that, for reasons that are not altogether clear, there has, during the last two years, been a remarkable increase in the number of shad in the Hudson River. This fact, coupled with important measures lately put into effect by the Conservation Commission to insure the future supply of shad, give strong support to the belief that the day will yet return when Hudson River shad will occupy the same prominent place on the menus of the State that it did in days gone by. The shad figures of the United States Bureau of Fisheries, compiled in cooperation with the Conservation Commission, and covering the last five years, show in a striking manner the sudden improvement in the run of shad during 1918 and 1919, following the seasons of 1916 and 1917, when the catches were the smallest on record. They are given below:

Shad Fishery of Hudson River, 1915 to 1919

	Fishermen	Boats used	Gill nets	Haul seines	Investment	Number of shad caught	Pounds	Value
1915......	160	92	86	2	$11,197	15,855	68,668	$8,643
1916......	119	70	79	3	7,845	9,287	40,173	5,465
1917......	149	76	215	13	14,595	12,015	43,384	6,540
1918......	227	125	273	15	20,107	67,403	234,602	48,184
1919......	296	158	373	12	31,611	90,301	374,974	83,724

These figures include the shad fishery of both the New York and New Jersey waters of the Hudson River. The report shows further that, of the total catch, 301,306 pounds of shad were taken in New York waters and 73,668 pounds in New Jersey waters in 1919.

The catch of 1919, as compared with that of 1916, shows an increase of about 1,000 percent in the number of shad, and of about 1,500 percent in value. No adequate theory has been advanced in explanation of this gratifying return of the fish. Undoubtedly a number of causes have been contributory.

It must be borne in mind that any increase is directly dependent upon favorable conditions several years previous. The shad in the river in any one year are those which successfully found their way back to the sea from the spawning grounds the year in which they were hatched. That shad do not always return to spawn in the same river where they were hatched is proved by conditions on the Pacific Coast, where shad were artificially introduced in 1872. Although all liberations of fish occurred in the Sacramento River, the shad now enter suitable rivers in a coast line of about a thousand miles. Incidentally, as the result of wise protective measures, shad are now much more abundant on the Pacific Coast than they are in their original habitat along the Atlantic seaboard.

It is believed by fish culturists that the number of years which elapse between the hatching of a shad and its return to fresh water for spawning purposes is usually three. It is therefore significant that, as indicated in the table, the number of shad fishermen on the Hudson River reached a low ebb in 1916 — just three years prior to this year's large run. The decrease in fishermen was doubtless due to the small profits derived from the shad fishing industry in the years immediately preceding, with the result that the shad fishermen sought other employment. Military service also probably withdrew its quota of men from the fishing industry. Although our figures relate only to the Hudson River, the same conditions doubtless prevailed in all rivers.

With fewer shad fishermen, there were naturally fewer shad nets, as is indicated in the official Hudson River count. The table also shows that during the lean years, there was a shrinkage in capital invested in nets greater in proportion than the decrease in the number of nets. This would indicate that the gear was not being maintained in the highest state of efficiency, but was being allowed to run down. Less fishermen, fewer nets and poorer nets — these, then, are some of the reasons why a larger number of shad were able to reach their spawning grounds in 1915 and 1916.

The work of artificial propagation, carried on by the Conservation Commission, also had definite relation to the present supply of shad.

Fisherman have been quick to take advantage of improved conditions in the shad industry and of the great advance in the price of the fish, as is shown by the table. However, belief that the Hudson River will not again be quickly depleted of its shad is based upon definite steps taken during the last two years by the Conservation Commission, looking toward the protection and continued supply of shad.

In 1918 jurisdiction of the Commission was extended by the Legislature to include the lower waters of the Hudson to its mouth. Previously it had ended at Verplanck's Point, near Peekskill. The Commission lost no time in taking advantage of the new powers vested in it, by issuing an order that all shad nets throughout the New York waters of the Hudson River be taken up between sundown on Fridays and sunrise on Mondays — a provision which previously had been effective only north of Verplanck's Point. Opportunity was thus provided for more shad to pass through the vital lower stretches of the river and reach their spawning grounds.

In addition to this order granting the shad a "safe conduct" each week end, the Commission regulated the netting privileges during the rest of the week and all persons who wished to catch shad in any part of the Hudson River had to provide themselves with a license issued by the Commission.

The Conservation Commission's vigorous campaign against stream pollution throughout the State, inaugurated last year, is also bound to have its beneficial effect upon shad. The discharge of domestic or industrial wastes into any stream in a quantity "injurious to fish life" is a direct violation of the Conservation Law of the State. It is therefore on the basis of its effect upon fish that the Conservation Commission is now engaged in a State-wide investigation of the stream pollution problem, under a special appropriation for this purpose granted at the last session of the Legislature.

Still another important step taken by the Commission was the setting aside in April of this year of a shad refuge in the Hudson, as a result of a petition submitted by the shad fishermen themselves for an area of safety on the spawning ground of the fish, where no fishing should be permitted. The region designated by the fishermen as the natural breeding ground of the shad is known as the "flats" and begins at the red buoy north of Kingston Point and continues in a northern direction to the red buoy opposite the village of Barrytown. An order issued by the Commission forbade the use of nets of any kind on these shoals from March 15 to June 15.

To render doubly efficacious this reservation for the protection of shad spawn, the Conservation Commission wrote to the various steamboat companies, whose boats pass the Flats, and requested that they instruct their captains to navigate this section at reduced speed. The object was to prevent the breaking up of the shad spawn by the waves from the boats — which the fishermen claimed was a serious cause of the depletion of the shad. Without exception, the steamboat companies with whom the Commission corresponded expressed their entire willingness to cooperate.

One more obstacle to the welfare of the shad has been considered by the Conservation Commission, and that is the problem of the spawn-eating fishes that inhabit the Hudson. In its policy of encouraging the widest possible capture of these fish by the commercial fishermen, the Commission is attempting at least to hold them in check, even though it is impossible to eradicate them. During the year 1918 no less than 279,392 pounds of German carp, 182,052 pounds of eels, and 134,311 pounds of suckers were removed from the Hudson River, all of which were largely in excess of the amounts taken the previous year.

It would seem that the Conservation Commission has made every possible provision within its power for the safeguarding and increase of the shad in New York State. As fast as new opportunities of conservation present themselves, it will embrace them. This year, for instance, by the use of a motorboat, greatly improved methods have been adopted in gathering from the fishermen the shad eggs used for hatching. It is to be hoped that as soon as possible the Legislature will extend the jurisdiction of the Commission to all of the State's tidal waters, thus bringing within its control the waters of New York harbor, where at present it has no power to license the shad fishermen or regulate the mesh of their nets.

Spearing Permits. The usual orders permitting the spearing of suckers during the spring months in waters not inhabited by trout have been issued, have been very acceptable to the public, and have been abused but little.

Carp. The rapid increase in carp in the lakes and rivers in the State, and their great destructiveness to native species of fish, has made it necessary for the Commission to permit the use of licensed seines for taking them. They are very prolific, and frequently obtain a weight of fifty pounds. When, in addition to this, it is understood that they travel in schools, rooting up the bottom, destroying spawn, and generally upsetting natural conditions, it is apparent that they must be held in check in every possible way. They find a ready market in the large cities, and are sold at a moderate price.

BUREAU OF FISH CULTURE

Fish cultural operations during the first year after the war have encountered more adverse conditions than during the war in respect to increased costs in nearly every direction, scarcity of competent labor, and difficulties in trained service for the distribution of the hatchery products. This last difficulty was overcome to some extent by the use of the few available trucks.

The table of output for five years, given on page 84, indicates that notwithstanding adverse weather conditions during the collection of the eggs of spring spawning fishes the year's work taken as a whole has been quite satisfactory.

In making a comparison of the output by species, it should be kept in mind that new standards for the measurement of eggs of species produced in numbers running into the millions have been adopted during the past two years, for the purpose of obtaining more accurate figures as to output. At most of the hatcheries, a check against errors has been provided by having the eyed eggs measured by a representative of the Commission, in cooperation with the foremen.

More applications are received for brook trout than have been received for all other species. The past season has been unusually successful with this species, with less loss during incubation of the eggs, and a production of more and larger fingerlings. The lower mortality during incubation is attributed to the policy adopted last winter of sending messengers to the distant commercial hatcheries for the eggs, thus safeguarding the eggs against extreme weather conditions, and insuring prompt delivery.

Applications for Fish. The total number of applications, upon which fish were supplied, was 3,878. This includes plantings made by employees of the Commission of such commercial species as flatfish, tomcods, smelts, lobsters, lake herring, shad, and some others. These commercial species planted by the Commission are, however, covered by not more than fifty applications, even though they involve many millions of fish.

There has been a material reduction in the number of applications for the trouts, which make up the bulk of all applications received. This has been the result of the campaign for a permanent policy and the discouragement of the practice of sending large numbers of applications for the same stream under the names of many individuals, instead of one application in the name of a club or individual. This has effected a saving of labor and filing, and also in the work of the foremen in sending notices to applicants both by mail and wire. It has also minimized many other details connected with shipments, without in the least interfering with the proper stocking of waters in which the applicants were interested. In fact, it is believed that a careful canvass of the records will show that more waters received fish this year than in previous years.

In the filling of applications, the practice prior to 1918 had been to allot a stated number of fish upon each application. In 1918, however, the experiment of allotting a definite number of cans of fish to each application was adopted, and was so satisfactory that this method was continued during 1919. With the trouts, the allotments range from one to two cans to each mile of stream. If the applicant who has been alloted two cans of trout accepts fry, he receives approximately 10,000. If he desires advanced fry, be receives about 6,000. If he specifies fingerlings, he receives all the way from 2,500 down to 100 fish to each can, the actual number being the maximum carrying capacity of a ten gallon can for fish of a certain size. The applicants appear to be well satisfied with this innovation.

Although there is a great difference of opinion as to whether the best results are obtained by planting 5,000 sac absorbed fry or, for instance, 250 four-inch fingerlings, experienced fish culturists are inclined to favor the planting of 5,000 fry, provided it is possible to distribute the fry in the head waters of spring rivulets tributary to the stream which it is desired to stock. Spring rivulets may be found tributary to nearly all good trout streams. They may vary in length from one or two miles to a few feet. In width they may vary from six inches to two feet, and in depth from one to six inches. The number of fry to be planted in such rivulets depends very materially upon the length of the stream, and the prevailing abundance of food. Few persons have opportunities to study the food conditions, and it is accordingly safe to generalize by the allotment of 5,000 fry to each mile of spring rivulet, with the understanding that special care will be taken to scatter the fry the entire length of the rivulet by planting a few at frequent intervals with a dipper.

There is an important argument in favor of planting fry, namely, the instinct of self preservation, which is developed better and sooner at the time of sac absorption, when the fry instinctively seek natural food. The planting of fingerlings late in autumn, when the water is very cold, is to be discouraged, for the reason that after being trained to receive artificial food several times daily during a period of several months, if planted in these cold waters, which are almost devoid of food, fish which have been unaccustomed to seek food under natural conditions become weakened from starvation and are an easy prey to any fish of larger growth inhabiting the same waters.

TEN YEARS AGO LAKE TROUT WERE FIRST STOCKED IN LAKE GILEAD, WESTCHESTER COUNTY.

Small fingerlings, properly planted the latter part of May or during the month of June, reach the waters it is planned to stock at a period of the year when there is far greater abundance of minute animal life. The natural food upon which they feed then exists in greater abundance than later in the season when the larger fingerlings are planted. The results obtained from planting twice the number of two-inch fingerlings that can be furnished of four-inch fingerlings two or three months later will accordingly be in favor of the two-inch fish.

The chief argument against the planting of fry is that they are less able to withstand unfavorable conditions than are fingerlings, and many of the applicants for fish have not been trained to give the planting the attention which it requires. The Commission is accordingly devoting much attention to systematic educational work among the applicants, with a view to better planting, and meanwhile is continuing its efforts to increase the output of fingerlings.

Under any system of making allotments, care must be taken to insure the filling of all applications; in avoiding a shortage it is quite natural to have some surplus. During the past year the fingerlings averaged so much larger than heretofore, with a resultant large increase in the number of cans required to transport them, that, after filling all applications, there remained at the hatcheries over five hundred cans of large fingerlings. These were distributed as an encore to applicants, selecting as far as possible those whose earlier allotments consisted largely of fry, advanced fry, or very small fingerlings.

Of the total number of fish distributed in 1919, the commercial fishes predominated, 77 percent, or 410,698,000, having been distributed for the improvement of waters where there are established commercial fisheries. Of this number, 303,720,000 consisted of anadromous and marine species (including the lobster), and the balance are lake herring which were planted in Lakes Erie and Ontario. Of the many millions of whitefish and pikeperch produced, practically all were planted in waters where no commercial fishery exists.

Notwithstanding the fact that 77 percent of the 1919 hatchery production consists of commercial fishes, it represents an expenditure estimated at only about 10 percent of the total amount of money expended in the operation of the hatcheries. This would appear to be a strong argument for additional appropriations for the benefit of the commercial fisheries, such as, for example, the small appropriations for the establishment of two marine field stations.

Live Fish Exhibits. Following the usual custom, fish were furnished for the Rochester State Exhibition, the State Fair at Syracuse, and county fairs during the fall. These exhibitions attract much attention, and are very effective in stimulating interest in fish planting in the localities where the exhibits are given.

Canal Ponds. Portions of the abandoned Erie and Champlain canals were first utilized for fish propagation during the year 1918. It will be recalled that they were first used before they were completed, in order not to lose the opportunity for some fish production, and to gain experience for subsequent guidance. A successful demonstration of the possibilities of the canals was thus made, and much information obtained regarding defects which must be remedied. The chief defect is the difficulty of thoroughly draining each section. To accomplish this involves more labor than was originally contemplated, for the reason that the bed of the canal is not level, and that at frequent intervals there are hollows which remain full of water after the main part of the canal is drawn. It is not only impossible to remove all enemies to fish culture as long as these hollows exist, but it is also impossible to harvest all of the young fish.

Efforts were made during this year to overcome these defects in the canals at both Schuylerville and Fort Hunter, but owing to the scarcity of labor the work was not completed at the time when it was necessary to begin fish culture operations. It is now estimated that to put these ponds in perfect condition, with complete drainage facilities, will involve an expense in labor and materials — largely labor — of from $700 to $1,000.

The canal ponds are now producing two species of fish not heretofore propagated by the Commission. These are bullheads and largemouthed black bass. It is interesting to note that 43,870 largemouthed bass fingerlings were produced from only 352 adult bass obtained from the Tomhannock Reservoir near Troy, and that 48,500 bullhead fingerlings were produced from 1,060 bullhead adults obtained from Chautauqua Lake. These figures alone make it clearly apparent that when the canal ponds are in final working order, and free of enemies to fish propagation, their total output will be very great.

When fully in commission, the canal ponds are capable of carrying brood fish over the winter, thus obviating the necessity of catching and liberating them annually. At Schuylerville the ponds now contain the brood fish of last year, but more are needed of both largemouthed and smallmouthed black bass.

At both Schuylerville and Fort Hunter there should be storehouses for equipment and shelter for workmen during inclement weather. It has also developed that work on these ponds is impractical without use of a truck from about the first of April to the first of August.

During the first year of the operation of the ponds, a total of 28,842 fingerlings was produced. This year, however, even with many important details of the ponds uncompleted, the output has been increased nearly four times, amounting to 100,768. The details of the canal production are given in the following table:

Distribution of Fish From Canal Ponds, 1919

FORT HUNTER		
Small mouthed bass fingerlings	2,350	
		2,350
SCHUYLERVILLE		
Smallmouthed bass, fingerlings	300	
Largemouthed bass, fingerlings	43,870	
Bullhead, fingerlings	48,500	
Bullhead, yearlings	5,748	
		98,418
		100,768

Stream Surveys. During the summer of 1918 a survey of the streams of Tompkins County was made by Professor G. C. Embody of Cornell University, with the help of two of his students. Inasmuch as many of the streams have their sources in adjoining counties, it seemed advisable to complete the survey of the adjoining watersheds in other counties. This work has been done during the past summer under the direction of Professor Embody, who was unable personally to give a great deal of time to it, but directed the work of the two assistants who worked in conjunction with him the previous year. The survey has been made in a similar manner to the one which was made for the streams of Oneida County, and an early report is expected. A great many of the streams in the region covered are inhabited by foreign species of trout and the survey will clear up many questions which have involved correspondence in an effort to put the right fish in the right place and have a permanent policy.

With a report listing all streams and the treatment of each, such as is embraced in the survey of the streams of Oneida county, it is not necessary for the Fish Culturist to pass on each individual application. Any clerk can see whether the application calls for the species recommended in the survey, and if not, turn the application over to the Fish Culturist for further action. The Commission has become more and more convinced that a survey of the waters of the State, with a report and decision as to a permanent policy with regard to each, is of paramount importance in connection with efforts to improve the fishing conditions and effect economies in administration.

By conducting a tremendous correspondence a permanent policy has been tentatively established in regions where waters are stocked with several species of trout, but new questions are constantly arising as to whether the permanent policy in regard to the treatment of some streams is correct, and actual survey is necessary.

An attempt was made to secure other biologists to make a survey of streams in other counties, but without success. It seems that war conditions have created a new demand for men of scientific training, and their value is more appreciated than heretofore. It is hoped, however, that a number of competent men will be employed during the coming summer. In all probability, it will be necessary to pay them more than heretofore, the prevailing rate in past years having been less than that paid ordinary laborers, who can neither read nor write.

During the last year the Commission was requested to consider the advisability of a new hatchery to be located on Lake George. It is felt, however, that it would be more advisable first to make a complete survey of the lake, and reach definite conclusions as to which of the seventeen species heretofore introduced into the lake should be propagated in the future. It is futile to expect results from a great many species. It may be possible to determine to what extent angling in Lake George is inferior to that of some other lakes, as to certain of the game fishes, and to determine what species of game fishes may be expected to produce the best results. Having made this determination, vigorous effort should then be made to produce those results with the species which it is decided will produce the most food and sport. This same policy should apply also to other lakes. There are other important bodies of water, much used by fishermen, which at the present time do not appear to be producing the maximum results. Illustrations are Cranberry Lake, the St. Regis Lakes, Canandaigua Lake, and some of the Finger Lakes.

Because of the necessity of determining questions of fish planting policy, if the best results are to be obtained with the product of the hatcheries, the Commission accordingly recommends an annual appropriation of not less than $5,000 for this purpose.

Notes on Hatcheries

Adirondack Hatchery. A falling off in total output is due largely to the discontinuance of the collection of frostfish eggs. There was a large increase in output of fingerling brook trout and landlocked salmon, as against a material reduction in output of lake trout; the space occupied by the latter the previous year having been given to the brook trout eggs, the product of which is in more general demand. The year's production may be regarded as very satisfactory.

Bath Hatchery. A most successful season has been had at the Bath hatchery. The total output is 185,678 lower than in 1918, due to a readjustment to local demands as to species. The hatchery was provided with less lake trout eggs, for which species the local demand is limited, and the space was taken by brook trout eggs, the product of which amounted to more large fingerlings than heretofore produced and for which there is a demand quite equal to the capacity of the hatchery. This large production of brook trout fingerlings was made possible by improvement of the water supply.

Caledonia Hatchery. The important work of this hatchery consists of the production of brook, brown, rainbow, steelhead and lake trout, of which the output in both fry and fingerlings far exceeds the production of the previous year. A brood stock of brown and rainbow trout is maintained, from which eggs are obtained not only to meet local demands but also to supply other hatcheries. The supply of eggs of smelt, whitefish, lake herring, pikeperch and muskellunge, which in numbers contribute the larger portion of the output, are allotted from other hatcheries or field stations, and vary from year to year. For example, the production of lake herring fry was nearly 20,000,000 less than in the year 1918, due to the fact that the new Dunkirk hatchery was in commission. As the water supply at Caledonia is abnormally warm, causing herring eggs to hatch before the natural time for planting them, the hatching of this species will be diverted to the Dunkirk hatchery, which was established for the purpose of handling this species.

Chautauqua Hatchery. This hatchery is devoted especially to the production of muskellunge obtained by collecting eggs from spawning fish caught in Chautauqua Lake. The total output will vary from year to year, successful egg collections being dependent upon weather conditions. The production of muskellunge far exceeded the output of the previous year. Incidental to this work, it is possible to produce fingerling brook trout in sufficient numbers to amply provide for local demands. The output of brook trout in 1919 exceeded that of 1918 by about 33 percent. Until the year 1918 it was customary to hatch lake herring eggs at the Chautauqua hatchery, but this is no longer necessary or desirable, because this species can now be cared for at Dunkirk, adjacent to the waters to be stocked.

Cold Spring Harbor. At this station is maintained a brood stock of brook, brown and rainbow trout for egg producing purposes. A few years ago disease wiped out the brood stock of brook trout and no attempt was made to restore the stock for several years. The disease germs apparently have been eradicated from the ponds and an effort is being made to increase the number of brood fish of this species. In addition to the supply of brown and rainbow eggs produced for local needs, it is customary to provide with eggs of these species other hatcheries which have no facilities for maintaining a stock of brood fish. During the year there was an increase in the production of fingerling brown and rainbow trout and a reduction in the output of brook trout, which was intentional. Of these three species, the larger portion is shipped away from Long Island, because the local demand is not equal to production.

In addition to the production of the three species of trout, which occupies the attention of the employees throughout the year, field stations are operated for the collection of eggs of smelt, tomcod and flatfish. The eggs are transported to the hatchery for incubation and the product is distributed to applicants and to replenish the waters where the eggs are collected.

The production of 118,000,000 tomcod fry and 37,000,000 flatfish fry is the purest kind of conservation, because the eggs were obtained from fish caught by commercial fisherman, and without the efforts of the Commission, would have been entirely wasted.

Under the supervision of the foreman of this hatchery, mature egg bearing lobsters were purchased at Montauk during the season for them. Three holes were punched in the tail of each one to prevent resale if again captured, and then the lobsters were liberated in Fort Pond Bay. There is a growing belief that this method of permitting the parent lobster to distribute her young, as they emerge from the eggs, is preferable to scraping them off to be artificially incubated. The method is more satisfactory to the fisherman and results in more cooperation on their part. The number reported as distributed is based upon a knowledge of the average number of eggs produced per pound weight of parent lobsters, and is given for the purpose of comparison in output with previous years. Until recently the Montauk fishermen brought in many lobsters caught in Rhode Island waters, making it possible to record a much larger production than is now possible.

The total production of the hatchery exceeds all previous years back to 1915, when adult blue crabs were purchased and planted to the number of 6,000 with an estimated production of 77,500,000 fry.

Delaware Hatchery. This hatchery is equipped to produce brook, brown and rainbow trout fry and fingerlings and is very largely dependent upon other hatcheries and commercial dealers for its supply of eggs.

Owing to high water temperature and a reduced water supply in dry seasons, the production of fingerlings is limited. During the past year the production of the three species exceeded that of the previous year by about 22 percent, and the season may be regarded as a satisfactory one for this station.

Fulton Chain Hatchery. The function of this hatchery is to produce brook and lake trout, land locked salmon and whitefish. Eggs of the first three species are largely furnished from other sources. In connection with this hatchery, a field station is operated on Fourth Lake for the collection of eggs of lake trout and whitefish. Only a limited number of lake trout eggs are obtained from this source of supply. The total output of the hatchery varies with the seasonal conditions in the collection of whitefish eggs. Of this species, the output in 1919 was less than that of 1918 by 1,760,000. There was an intentional reduction in the number of lake trout eggs allotted to this hatchery, in order to have space to produce a larger number of brook trout, for which, proportionately, there is a larger demand. The water supply of this hatchery is quite unsatisfactory for the production of fingerlings, but it is hoped that this condition will be remedied when title is obtained to property for the purchase of which an appropriation is now available.

Linlithgo Hatchery. This hatchery is equipped with troughs to hatch trout, and with jars to hatch shad and any other fresh water species hatched in jars. As has been stated in previous reports, the water supply is abnormally cold during the period of incubation of trout eggs, is impeded by anchor ice at varying intervals, has the maximum saturation of mud during freshet periods, and in warm weather varies in temperature almost as much as does the air.

The trout hatch very late in the season and can be held but a short time. Last winter was a particularly favorable one as to weather conditions, and the production of trout was accompanied by less loss than usual.

The collection of shad eggs exceeded that of any previous season for a number of years. Its success may be attributed to the use of the protectors' boat, which made regular trips among the fishermen to receive their eggs.

During the past two years, the hatching of lake herring eggs at this station has been discontinued. With the completion of the herring hatchery at Dunkirk, and the proposed one at Sodus Bay, there will be no occasion to transfer herring eggs so far from waters to be stocked. Accordingly a comparison of output with years previous to 1919 should be made with a knowledge of this change in policy.

Oneida Hatchery. The primary function of this hatchery is the collection and incubation of pikeperch eggs for distribution as fry, and the collection of adult smallmouth black bass from Oneida Lake. The bass are placed in small artificial ponds and there they reproduce naturally upon gravel nests provided for the purpose.

The pikeperch are caught during the spawning season by the use of trap nets set in Oneida Lake, and by means of a slat trap set in Scriba Creek. The results in take of eggs depend entirely upon seasonal weather conditions. The season for collecting eggs in 1919 may be regarded as the most unfavorable one since 1915, as indicated in the comparison of output for the past five years.

Twenty-two trap nets were employed in catching the brood stock of black bass. The period during which the nets are set for this purpose varies from a month to six weeks. The output of fry varies with seasons, weather conditions and sudden changes in temperature seriously affecting the crop. The fry thus produced are netted and distributed to applicants, a portion of them being planted in the lake. The adults are returned to the lake after the harvest of fry.

The yellow perch fingerlings accredited to this hatchery are obtained by netting them from Scriba Creek, to which they resort in large numbers during the fall.

The principal falling off in total output of this hatchery for the year 1919 is due to the diversion of an allotment of lake herring eggs to the new hatchery at Dunkirk. This was done not only because the Dunkirk hatchery was regarded as the logical place for hatching the herring eggs, but also because, as a war measure, it meant the saving of coal and labor at Constantia. To take the place of this work in the winter season, arrangements have been made for hatching the quota of brook trout intended for adjacent waters. This will obviate the expense of transporting them from a distance and will deliver them in better condition to applicants.

If egg collections are successful at Sodus Bay, a portion of those, the product of which will be returned to Sodus Bay, will be hatched at the Oneida Hatchery.

St. Lawrence Hatchery. This station is equipped with ponds for the propagation of smallmouth black bass and other pond fishes. The brood fish are annually netted from the St. Lawrence River and placed in the ponds, where gravel piles have been prepared, to which they resort to spawn.

After the fry have left the nests, harvesting begins, until all of the young have been distributed as fry and fingerlings. The brood fish are then returned to the waters from which they were taken.

The crop of young varies with seasonal conditions, and the actual number varies according to the age when distributed. If all are distributed as fry, the number will exceed many times the number it is possible to harvest as fingerlings; the larger the fingerlings, the longer the period of cannibalism and the smaller the final crop. During the past season, the crop was almost a failure, owing to a disease which caused a serious loss of brood fish and interfered with the spawning functions of the survivors.

The season for bass propagation occupies the attention of the employees about four months. In order to utilize the foreman at other seasons of the year, field stations for the collection of pikeperch eggs are operated on the Oswegatchie River at Ogdensburg and upon Fish Creek, a tributary to Black Lake at Pope Mills. A portion of the eggs thus obtained are shipped to other hatcheries and the balance are hatched in a temporary makeshift equipment set up in the power-house.

The power-house equipment is entirely inadequate for good work, but owing to the lack of space, it is impossible to improve upon it in the present structure. Were it not for the fact that there is a demand for pikeperch fry to stock local waters, all of the eggs would be shipped to other hatcheries.

Because of a local demand for muskellunge, eggs of this species are shipped from the Chautauqua hatchery and incubated in the temporary power-plant equipment, but not in such numbers as would be possible provided there was a suitable plant in which to hatch them.

During the seasons of 1917 and 1918, yellow perch were placed in one of the ponds, from which there was a satisfactory crop of fingerlings, but during the past season this work, like that with the black bass, was a failure. If a truck is available next season, it is predicted that many millions of yellow perch eggs can be rescued from the marshes on Black Lake, where they are left by the receding waters suspended and exposed to the air, attached to vegetation which was submerged when the eggs were deposited by the parent fish.

NEW OUT-OF-DOORS REARING TROUGHS AT THE WARRENSBURG HATCHERY HAVE INCREASED THE OUTPUT.

Warrensburg Hatchery. An examination of the tables shows that during the years 1917-18, lake trout and steelhead trout were produced, in addition to the brook trout and landlocked salmon, but that in 1919 the two first-mentioned species were not produced. It has been found that the water supply at Warrensburg is better adapted to the production of fingerling brook trout and that there is a larger demand for this species in the Warrensburg zone than for the other species. On the other hand, the lake and steelhead trout can be conveniently produced at the Caledonia hatchery, the water supply of which is not so congenial for brook trout. Furthermore, the needs of lake trout in the Warrensburg zone can be well cared for by shipments in carload lots from Caledonia, and this species bears the long journey better than does the brook trout.

By this change in policy the waters of the Warrensburg zone received more trout of both species than in previous years. The production of the hatchery also was larger than in any previous year. This increase in production may be attributed partly to the natural progress in the development of a comparatively new hatchery, partly to the change in policy, and finally to the use of a new supply of spring water in outdoor rearing races. These races were begun by temporary constructions in 1918, and have proved so successful that permanent concrete constructions were in course of completion at the time of making this report.

The capacity of this hatchery, 1,000,000 good-sized fingerlings, may be regarded as having been reached.

Dunkirk Hatchery. This station is equipped for hatching all species of Great Lakes fishes which it is customary to hatch in jars, and particularly the lake herring, which is of so much importance to the boats fishing out of Dunkirk. It is upon these boats that the Commission must largely rely for securing herring eggs. In addition to the lake herring, it should be possible to collect eggs of the whitefish, pikeperch and yellow perch.

Opportunities for collecting whitefish eggs in the American waters of Lakes Erie and Ontario, so far as known, are all taken by the United States Bureau of Fisheries and the states of Ohio and Pennsylvania, and all of these governments are collecting from Canadian waters of the two lakes. The Canadian field is not all covered, but the Canadian authorities are showing increased activity in fish culture, and particularly in the propagation of the commercial fishes of the Great Lakes.

During the past season two regular employees of the Dunkirk hatchery accompanied the boats fishing out of Dunkirk and assisted as spawn takers. The field superintendent had general supervision of the egg collecting in the Dunkirk field, and was assisted by foremen and other employees from several hatcheries, all of whom, including the foremen, sailed each day with the fishing boats and secured as many eggs as they could from the ripe fish as they were taken from the nets.

In addition to the local collections, it was decided to hatch at Dunkirk a large portion of the herring eggs collected at Sodus Bay and to discontinue that class of work heretofore performed at interior hatcheries, such as Linlithgo, Constantia, Caledonia and Chautauqua. Accordingly orders were issued to ship the Sodus eggs to Dunkirk. The electric power plant, however, was put out of commission by storm and the auxiliary gasoline engine refused to work. To promptly dispose of the eggs, they were shipped to the Erie, Pennsylvania, hatchery to be hatched on shares. The herring production of the Pennsylvania hatcheries all goes into Lake Erie anyway, but the share belonging to this Commission was brought to Dunkirk for distribution and is accredited to the Dunkirk hatchery.

Eggs collected during the latter part of the season were incubated at the Dunkirk hatchery and demonstrated the possibilities of the hatchery for future work. The foreman reports that the eggs produced " the nicest lot of fish he ever planted."

Distribution of Fish by Species

FROM JANUARY, 1915, TO DECEMBER 31, 1919

	1915	1916	1917	1918	1919
Bullhead, fingerlings	5,006			22,210	48,500
Bullhead, yearling					5,748
Bullhead, adults	12			200	209
Buckeye shiner, fingerlings	10,014				
Shad, fry	696,418	511,000	120,000		2,160,000
Shad, fingerlings	550,000	900,000	2,665	2,054	
Tullibee, fry	3,150,000	8,350,000			
Whitefish, fry	19,690,000	23,908,000	28,351,000	24,360,534	19,015,000
Frostfish, fry	100,000	1,025,000	540,000	126,525	
Lake herring, fry	89,090,000	65,840,000	77,000,000	38,115,000	106,978,000
Brown trout, fry	195,000	106,000	159,000	55,000	36,000
Brown trout, advanced fry				4,000	36,000
Brown trout, fingerlings	452,000	323,750	481,750	497,825	550,520
Brown trout, adults	45	82	45	2	10
Steelhead trout, fingerlings	2,000	3,000	284,660	74,100	142,900
Rainbow trout, fry	177,500	248,000	31,000		47,000
Rainbow trout, advanced fry				14,000	
Rainbow trout, fingerlings	519,500	582,786	568,074	200,125	271,741
Rainbow trout, adults	143	122	96	12	12
Black spotted trout, fingerlings		10,000			
Black spotted trout, yearlings	500			715	
L. L. salmon, fry advanced					49,387
L. L. salmon, fingerlings	17,000	14,700	20,245	140,732	120,081
L. L. salmon, yearlings					27
Chinook salmon, fry			230,000		
Chinook salmon, fingerlings			111,000		
Lake trout, fry	385,000	2,865,000	1,405,000	2,335,300	683,000
Lake trout, advanced fry				64,000	38,000
Lake trout, fingerlings	458,200	1,647,575	1,566,675	2,138,592	1,053,700
Lake trout, adults, yearlings				2,200	6
Brook trout, fry	1,366,000	2,057,000	1,849,000	1,136,000	1,079,000
Brook trout, advanced fry				24,500	1,119,650
Brook trout, fingerlings	3,025,100	2,755,200	2,449,695	2,133,825	4,065,579
Brook trout, yearlings				750	
Brook trout, adults	26	32	7,151	13	18
Smelt, fry	120,600,000	118,000,000	126,767,411	119,392,000	141,886,000
Maskalonge, fry	3,905,000	4,250,000	6,439,500	3,950,000	4,251,500
Crappie, fingerlings		3,600		1,000	250
Crappie, adults					5
Largemouth bass, fingerlings	2			4,300	43,870
Largemouth bass, adults	4				42
Smallmouth bass, fry	222,700	303,700	15,875	94,500	166,000
Smallmouth bass, advanced fry				1,000	1,800
Smallmouth bass, fingerlings	608,459	455,470	84,985	26,544	83,768
Smallmouth bass, adults	1,163	600	21	67	77
Rock bass, fry			2,320		
Rock bass, fingerlings				611	
Long-eared sunfish, fingerlings					15,000
Pikeperch, fry	29,000,000	118,460,000	49,900,000	54,722,250	69,481,000
Pikeperch, fingerlings	358				
Pikeperch; adults	252				
Yellow perch, eggs				1,740,000	
Yellow perch, fry	100,200,000	25,000,000	4,800,500	2,675,000	
Yellow perch, fingerlings	554,006	184,500	178,575	120,050	162,000
Yellow perch, adults	12				
Tomcod, fry	102,700,000	100,100,000	129,600,000	102,500,000	118,000,000
Flatfish, fry	58,000,000	38,000,000	33,600,000	33,000,000	37,000,000
Sea bass, fry	2,028,000		3,000,000		
Scup, fry	2,028,000				
Blackfish, fry	126,752				
Miscellaneous, fingerlings	32				300
Miscellaneous, adults	167				55
Lobsters	28,386,180	25,844,450	6,163,080	6,648,000	20,356,000
Blue crab, fry	77,500,000				
Blue crab, adults	6,000	10,000			
Total	645,756,551	541,759,567	475,729,323	396,323,526	528,947,755

DIVISION OF LANDS AND FORESTS

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Clifford R. Pettis	*Superintendent of State Forests*
William G. Howard	*Assistant Supt. of State Forests*
A. B. Strough	*Land Clerk*
Albert H. King	*Forester*
Arthur S. Hopkins	*Forester*
Benson H. Paul	*Forester*
Karl Schmitt	*Forester*
Kinne F. Williams	*Forester*
A. B. Brooks	*Forester*
Wilbur F. Smith	*Chief Land Surveyor*
E. M. Merrill	*Surveyor*
Lawrence McGrath	*Examiner of Forest Lands*
A. T. Davis	*Forest Surveyor and Draftsman*

DIVISION OF LANDS AND FORESTS

INTRODUCTION

Progress in the practice of forestry in New York State has come to depend primarily upon greater intensification of effort along lines for the most part thoroughly determined. The State forest policies are, in the main, already well established and understood, so that the chief task before the Commission is to make the practice conform as nearly as possible to these policies. The report of the work of the Division of Lands and Forests each year must accordingly deal chiefly with detailed accomplishments in familiar fields, with few opportunities for the discussion of entirely new lines of endeavor. This means that the report of a successful year's work will more frequently chronicle new high records than it will elaborate original ideas regarding forestry methods.

The fact that New York State's forest policy has become in general so well rounded and so well understood that we must concern ourselves more with the actual practice of forestry than with theories, is a matter for considerable satisfaction to the people of the State. It means that, whereas in many other parts of the country the states are still undecided on what they should do in forestry, New York is actually forging rapidly ahead in the retrenchment of forest losses.

The year just ended has been no exception to the rule of progress. We have established a new high record in reforesting State land, and a new high record in the prevention of trespass upon State owned property. New occupancies of the public domain in violation of the Constitution have practically ceased, while the clearing up of the older occupancies has progressed to a point where the end of the effort to free State land of illegal occupation is definitely in sight. Though extremely dry weather conditions prevailed in many parts of the Adirondacks during portions of the summer, there has been a material reduction in the number of fires, and the forest fire loss has been considerably less than the average. The work in other directions shows equally encouraging results.

In the following pages the various phases of the work of the Division of Lands and Forests will be discussed from the standpoint of greater intensification of effort, more efficient administration, and extension of established policies and methods to other parts of the State that are equally in need of forest conservation.

THE FOREST PRESERVE

General. The biggest and most vital responsibility of this Division is the administration of the State's enormously valuable Forest Preserve. This task would be more simple if the State land were found in a single large, homogeneous block, or even in a few comparatively large tracts, like the national parks of the west. Instead of being so consolidated, nearly two million acres of State owned land are scattered throughout 139 towns in 16 counties of the Adirondack and Catskill regions. While in some sections the State land is found in large tracts of many miles in extent, entirely unmixed with private holdings, in others it exists in small parcels of but a few acres, with private land upon all sides. The 1,767,778 acres of the Forest Preserve in the Adirondacks could be bounded by 210 miles of property lines, if it were put together in one square block, while the State land of the Catskills, if it were similarly compact, could be bounded by 53.6 miles. As an actual fact, however, because of the breaking up of the State property into many small pieces, the property lines aggregate more than 9,000 miles. Re-marking old boundary lines, and re-surveying where the lines are lost, must be done continually, if the State titles are to be protected. When, in addition to the size, it is considered that this property is worth upwards of $40,000,000, and the opportunities that it presents for camping and vacations are among the finest to be found in the east, it is clear that the task of protecting it from trespass and unreasonable and illegal use is a work of great difficulty. To this must be added the responsibility of increasing its area by purchase. Sections already denuded by fire must be reforested, and in common with the privately owned land of the Adirondack and Catskill regions, it must also be protected from destruction by forest fires. Each of these points, trespass, occupancy, acquisition, reforestation, fire protection, surveying, and public use, will be separately considered.

Trespass. It was only a decade ago that the value of timber illegally removed from State land each year was measured by thousands of dollars, frequently without adequate recovery by the State. Now the value taken each year amounts to only a few hundred dollars, and in every case, the State recovers fully, usually obtaining damages far in excess of the actual value of the timber, as a deterrent to other trespassers. This is due primarily to the more careful organization and increased efficiency of the forest rangers.

All through the year the rangers are patrolling the whole extent of their respective territories, in summer on foot and by water, and in winter on snow shoes, the total number of miles that they cover in this way in a year running into the tens of thousands. Each man is required to maintain such a close surveillance of all lumbering operations in his district that it is now actually impossible for timber stealing to be carried on upon any extensive scale. Intentional thefts have accordingly become less a matter of taking State timber in large blocks, and thus making a substantial sum at the expense of the State, but rather of picking out a few trees here and there, in the hope that detection may be avoided. The deliberate, large scale timber stealing of the past is thus ended, and the problem that is left is chiefly one of petty pilfering. In addition, there are of course occasional cases where the person cutting actually claims title to the property, or is in error regarding the exact location of the property lines. The forest rangers themselves are required to have such a detailed knowledge of the locations of these wilderness lines that they can immediately detect a case of apparent trespass, and report it to the Commission for appropriate action.

The practical impossibility of removing timber from State land without detection, when the rangers are properly alert, will be more readily appreciated when it is considered that in nearly every case logs from the State land must be brought out at some point upon a highway of travel, and must in most cases be sawed at a mill. Available evidence thus frequently includes not only the stumps on State land, but frequently also the trail out of the woods, and witnesses who have observed the theft in some one of its stages. In one case during the past year, the State's recovery was made certain by the introduction of evidence that the ranger and other witnesses had taken the butt ends of logs from the rollway of a saw mill, and had actually fitted them accurately upon the stumps on the State property.

The measuring out of complete justice was more difficult in the case of another trespasser, who carefully computed in advance the maximum penalty that could be imposed upon him for cutting a certain tree upon State land. Having decided that the tree was worth more as a sill under his barn than the amount of the penalty, and no other timber of sufficient size being anywhere available, he cut the tree and put it in place under the barn, greeting the ranger, who shortly appeared, with a smiling confession and an acknowledgment of entire willingness to pay whatever fine the State could impose. The fine collected was three times the highest market value of the tree, but in this instance the value of that particular tree as a sill under that man's barn was worth even more. Justice is traditionally blind, and sometimes even impotent!

During the past year there have been reported to the Commission but ten cases of trespass. In three of these, where the timber cut had a computed value of $46.28, the persons doing the cutting claimed title adverse to the State, so that it has been necessary to authorize the Attorney-General to institute appropriate action to determine the title and recover the damages. In three other cases, where $64.44 worth of timber was removed, there were two different surveyors' lines in existence, one correct and the other incorrect. These three latter cases have been satisfactorily adjusted with the trespassers, and settlements have been made with the State. The remaining four cases, involving timber to the value of $145.00, were due to careless surveying by owners of adjacent land. The correct location of the lines is being determined, and settlements will then be made.

The character of these ten cases, involving the cutting of only $255.72 worth of timber out of the $40,000,000 standing upon the State land, make it very plain that, in spite of the miles of boundaries, and the temptation which the high price of timber now holds out, trespass of any consequence upon the State land of the Forest Preserve can be, and is, effectively prevented.

Occupancy. New cases of occupancy of State land, in violation of Article 7, Section 7, of the Constitution, have practically ceased. As in cases of trespass, the reason for the decrease is due to the careful patrol work of the forest rangers, coupled with the fact that the Commission in 1915, as a result of the refusal of the Constitutional Convention to change the provisions of the Constitution, took up in earnest the work of terminating such occupancies.

At the time of the Constitutional Convention there were 911 recorded occupancies of the Forest Preserve, their character ranging all the way from the fencing of a portion of land for pasturage, or the building of a tar paper shack, up to the maintenance of expensive camps and even hotels involving investments of many thousands of dollars. In spite of the very complicated character of the problems presented, involving questions of title and the correct location of lines, the number of occupancies had been reduced to 194 at the end of last year. They have now been further reduced to 168. These are the cases that it will take longest to clear up, since most of them involve the determination of legal questions, upon which it will take some time for the courts to pass. One hundred and ten of these cases are now in the Attorney-General's hands, while 24 others are in preparation. In the remaining 34, surveys are needed. When the surveys are made, it will undoubtedly develop that in some of the cases there is actually no occupancy of State land, and in others the occupants will voluntarily vacate when the property lines are correctly established.

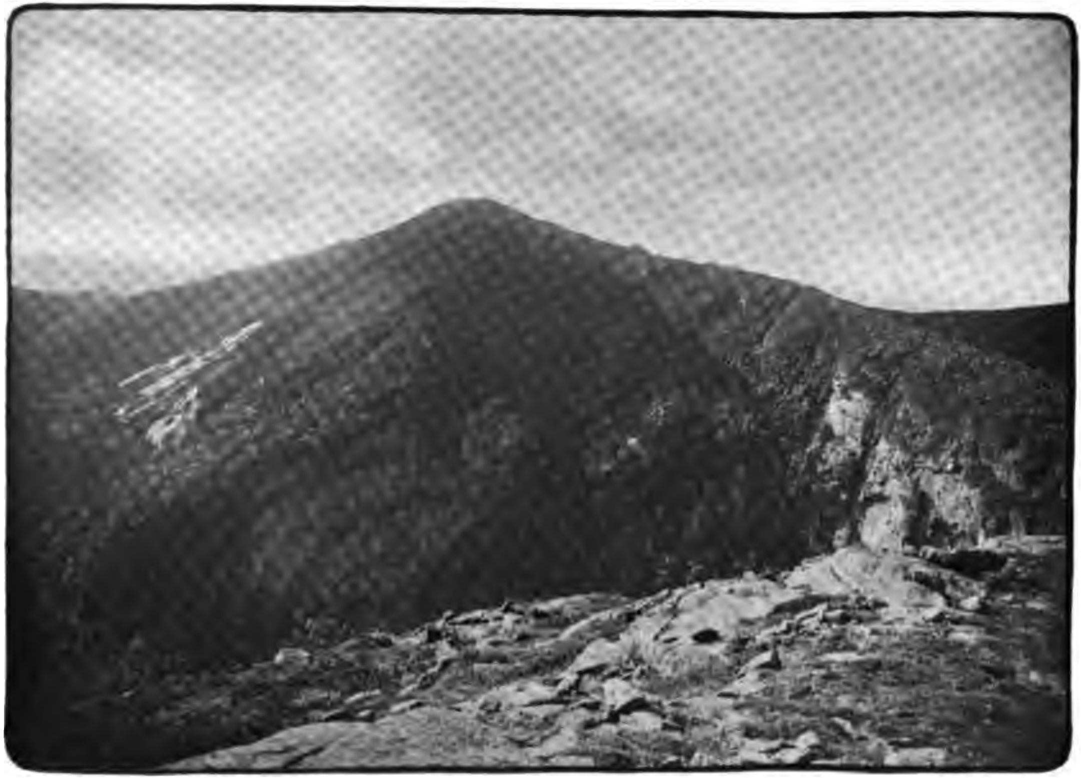
The result of the effort of the Commission to terminate all illegal occupancies of the Forest Preserve, a work that has been in progress only since the latter part of 1915, but which is already nearing completion, demonstrates clearly that it is quite as possible to enforce the provisions of the Constitution in this respect as it is in that of trespass. The policy adopted by the Commission throughout, however, has been as lenient as possible, and the occupants have been given every privilege which the Commission has felt could possibly be accorded to them under the Constitution and the law. In all cases they have been permitted to remove their structures if they have so desired, the time allowed for this being as much as they have needed, and frequently running into months and even more than a year. Under the law the Commission might have insisted that all structures be left upon the land, since they were a part of the real estate. It has been felt, however, that the statement of Article 7, Section 7, of the Constitution, that the lands of the Forest Preserve should be "forever maintained as wild forest lands" would be fully met if the occupants should be permitted to take with them any of their buildings that they desired. Enforcement of the Constitution has thus been effected with as little hardship as possible upon those concerned.

In the enforcement of the Constitutional provision against occupancy, the Commission has been actuated by two chief motives. The Constitution expressly prohibits such occupancies, and the law makes it mandatory upon the Commission to enforce the plain provisions of the Constitution. There has thus been no choice in the matter. As a corollary of this, the Commission has felt that a clean-cut demonstration of ability to carry out the provisions of the law and the Constitution, regarding protection and use of this great property, must be had before any greater latitude can be permitted in its use. It should be clear upon careful analysis of this situation that if it is impossible to enforce the provisions now in effect for the use and protection of the Forest Preserve, it would be even more difficult if those provisions should be in any way relaxed and a wider use of the property permitted under the law.

The Commission believes that it will be possible to permit a fuller use of the Forest Preserve in the future. It presents wonderful opportunities for use and enjoyment by all of the people of the State, and the Commission believes that at all times the very fullest advantages should be derived from it, consistent with its continued preservation and development. Obviously, this wider use must be regulated by the Constitution and the laws and the administrative rules of the Commission. If these regulations are wisely made from time to time, and if they are then strictly enforced, they may accord privileges that are constantly widening. Without such enforcement, the only safeguard of the Forest Preserve must be predicated upon the most restrictive regulations. The success of the Commission in reducing trespass to a negligible point and in eliminating illegal occupancies is thus a necessary precedent to wider use in the future.

Surveying. The preceding discussion of trespass and occupancy clearly indicates a great need for accurate surveys of State property. In many cases the lines have not been re-marked since the early surveys of more than a hundred years ago. It is of common occurrence in the administration of the Forest Preserve for important questions affecting the title to large tracts of valuable land to hinge absolutely upon the correct location of one of those old lines. To re-establish them is usually a matter of extreme difficulty, though it is still possible in nearly all cases. The method is to take the old field notes of the original surveys, and endeavor to follow them out in the field, checking this work by reference to old marks and natural monuments. As the survey party progresses, re-surveying the line as laid down in the old field notes, it constantly searches for some of the old line trees, particularly for trees that mark a corner. The frequency with which these old trees are still found is a testimony not only to the accuracy of survey methods more than a hundred years ago, but also to the carefulness of our own crews. The trees, when found, are

THIS ROTTED SPRUCE STUMP STILL BEARS THE BLAZE OF JOHN RICHARD'S SURVEY OF 1820.



The Peak of Marcy from the Top of Haystack, with Panther Gorge Between.

frequently dead. Sometimes only an old, nearly rotten stump remains. Usually the trained eye of the surveyor will find one of the characteristic scars that has overgrown the original axe marks of the first surveyor. Upon chopping into the heart of the tree, the original axe marks will themselves be found, and can be accurately checked with the field notes. It is apparent that, on account of the long lapse of time since the first surveys, it is vitally important that re-surveys be pushed at this time with all possible speed, if it is not to become forever impossible to relocate the original lines. There is the greatest necessity for re-establishing these lines and corners while data and marks, and the people familiar with them, are still available. This work should have the same legal effect as an original survey.

During the past year, six surveying parties have been maintained in the field, some of them making surveys to settle disputed questions of trespass or occupancy, others at work upon the establishment of old boundaries before the evidence is lost, and others running the lines around new property that is now being acquired. The amount of this work is so great that more of these parties should be equipped and put in the field without further delay.

Fire Protection. The year just ended has been an unusually favorable one from the standpoint of fire loss on the Forest Preserve. The area of State land burned was only 603 acres, upon none of which was there valuable timber. The reason for this small loss in comparison with the larger area of private land burned is found in the fact that the Forest Preserve land has not been recently lumbered, and accordingly does not contain highly inflammable slash.

The danger of fires can be materially reduced by the cleaning of trails frequently traveled by vacationists, and by the building of open camps and stone fireplaces in convenient places. This is an important detail of fire protection work that should be taken up immediately, particularly in view of the fact that thousands of vacationists, many of them without adequate appreciation of the danger of fire, are now traveling the trails of the Forest Preserve throughout the entire summer season. This point will be more fully discussed under the head of "Public Use."

Reforestation. In comparison with the low record of fire loss on State land, a new high record of approximately 5,100 acres reforested is particularly gratifying. It was estimated several years ago that approximately 125,000 acres of State land were denuded and in need of reforestation. Some of this land is already beginning to grow up to brush, and will eventually be naturally reseeded with valuable trees. It is thus apparent that if further extensive fire loss can be prevented, and if the rate of reforestation can be still further increased, in accordance with new methods that will be more thoroughly discussed on page 126, the time is not so far distant, as time is measured in forestry matters, when the scars of past forest fires upon State land will be very largely healed.

Acquisition. One of the most important activities of the Division during the past year has been acquisition of additional land for the Forest Preserve, with funds provided by a bond issue authorized by the voters in 1916. The work of acquisition is now carried on under a carefully developed plan, which permits it is to proceed systematically and with complete assurance that the State will receive full value for every dollar expended.

All tracts with valuable timber in quantity are first thoroughly cruised by foresters of the Commission, who determine the quantity of timber on the property. The work that the foresters do is entirely in the nature of a topographical and quantity survey. They are then followed by appraisers, who ascertain the value of the timber in the place where it stands. There is also frequent need for a surveying party to locate the exterior boundaries and mark them clearly. Following these careful examinations, an attempt is made to agree with the owner upon a purchase price. When this can be done, complete data regarding the property is then submitted to the Commissioners of the Land Office, with a recommendation for purchase. If the Commissioners of the Land Office approve the purchase, the matter is then referred to the Attorney General for approval of title, and eventually the necessary deeds are delivered to the State, payment is made, and the purchase consummated.

If it is impossible for the Commission to agree upon a price with the owner, and the land seems sufficiently valuable for Forest

PRIMEVAL FOREST ACQUIRED UNDER THE BOND ISSUE.

Preserve purposes, recommendation is made to the Commissioners of the Land Office that the land be appropriated. If the Commissioners of the Land Office approve the appropriation, the necessary steps are then taken by the Conservation Commission to acquire the property by condemnation. The question of value then goes to the Court of Claims for determination.

During the past year the lands offered to the State, the acquisition of which seemed advisable, aggregated 55,104 acres in the Adirondacks, and 12,522 acres in the Catskills, a total of 67,626 acres. The land examined by foresters and appraisers, some of which had been offered last year, included 67,295 acres in the Adirondacks and 17,029 acres in the Catskills, a total of 84,324 acres.

PULP WOOD ON THE HIGH SLOPES OF MARCY, THE CUTTING OF WHICH WILL BE STOPPED BY STATE ACQUISITION.

During the year the Commission has negotiated the purchase of 50,532.78 acres in the Adirondacks and 16,527.30 acres in the Catskills, a total of 67,060.08 acres. The average price agreed upon for the Adirondack land was $13.48 per acre, while the average price of that in the Catskills was $6.26 per acre. The purchases made during the year amounted to $784,862.49.

In addition there have been appropriated 97,387.89 acres in the Adirondacks and 1,740 acres in the Catskills.

All of these acquisitions have been approved by the Commissioners of the Land Office, though some of them must still be approved by the Attorney General and other steps taken before the purchases will be completed and the titles vested in the State.

The first effort of the Commission is to acquire land that lies on the high mountain slopes, where the danger of denudation following lumbering and forest fires is the greatest. These are the sections that should be forever maintained as protection areas, and upon which no lumbering should ever be permitted. When the region was formerly lumbered, the forests on these upper slopes were left untouched, because the low price of timber and pulp wood at that time made it unprofitable to operate in those more inaccessible locations. Now, however, the price of lumber and pulp wood is much higher and the timber on a portion of these high, steep slopes can be removed for manufacturing purposes. These facts account for the relatively high price of certain lands acquired.

WHEN HIGH MOUNTAIN SLOPES ARE LUMBERED, TREES LEFT STANDING QUICKLY BLOW DOWN.

In the last Annual Report to the Legislature, the Commission stated that the Shore Owners Association of Lake Placid had raised a fund of $30,000 as a gift to the State to pay part of the purchase price of land lying on the slopes of McKenzie and Saddleback Mountains, in order that these slopes might be immediately acquired for the purpose of stopping denudation. Since that time, public spirited citizens, interested in the welfare of the Adirondacks, have organized the Victory Mountain Park Association, for the purpose of collecting funds to assist in the acquisition of portions of Mt. Marcy and the forest surrounding it, as a memorial to the soldiers and sailors who lost their lives during the war. This fund is being raised by popular subscription in amounts ranging from one dollar up, and it will eventually be turned over as a gift to the State. Meanwhile, however, to check the lumbering that had already started on the mountain, the Commissioners of the Land Office, acting upon the recommendation of the Conservation Commission, have authorized the appropriation of all of the tract that is now threatened with denudation.

WEST CANADA LAKE AND ITS SURROUNDING VIRGIN FOREST IS A RECENT ADDITION TO THE FOREST PRESERVE.

Lands already acquired during the year, or the acquisition of which has been authorized by the Commissioners of the Land Office, include all or parts of the upper slopes of Mts. McKenzie, Saddleback, Whiteface, McIntyre, Marcy, Skylight, Redfield.

Allen, McComb, Seward, Seymour, Esther, Sawtooth, Colden, Cliff, and Wallface. While some of these lands have cost a comparatively large amount, due to the fact that they contain large virgin growths of softwood, it is nevertheless felt by the Commission that they are the forests of greatest value to the people of the State of New York as protection forests for the sources of some of the largest rivers, and as vacation grounds, including within their boundaries the most beautiful and impressive scenery of the Empire State.

In other parts of the Adirondacks, large tracts of lower land have been acquired at much less cost per acre, so that the average price paid for the year is very reasonable. Much of this low lying land rounds out other State holdings, and all of it has a high potential value as forest land for the future.

During the year, the Attorney General has approved title to 49,336.14 acres of land, the list of which appears on page 169. After taking into consideration the additions to the Forest Preserve and a few small and unimportant losses, the area of the Forest Preserve on January 1, 1920, is 1,886,550.81 acres. The details of the additions and losses are given on page 103. The losses are due to the fact that in the case of 99.32 acres, which were acquired by foreclosure of Loan Commission mortgages, it was found that the lands were not wild at the time of the foreclosure; in cases involving 499.75 acres, the courts have held that the State has no title; and in cases involving 508.08 acres, which were acquired at tax sales, the State Comptroller has canceled the sales.

SUMMARY OF LAND ACQUISITION, 1919

	Area offered (acres)	Area examined* (acres)	Area approved for appropriation by C. of L. O. (acres)	Area approved for purchase by* C. of L. O. (acres)	Average price per acre of land purchased	Total consideration for land purchased	Total area purchased and appropriated (acres)	Titles approved by the Attorney-General (acres)	Areas approved for acquisition in 1918 for which approval was rescinded in 1919 (acres)
Adirondacks	55,104	67,295	97,387.89	50,532.78	$13 48	$681,397 83	147,920.17	47,000.25	6,186.84
Catskills	12,522	17,029	1,740.00	16,527.30	6 26	103,464 66	18,267.30	2,335.89	....
Totals	67,626	84,324	99,127.89	67,060.08	$11 70	$784,862 49	165,187.47	49,336.14	6,186.84

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* Part of this area was offered prior to 1919.

FOREST PRESERVE AREA

January 1, 1920

Adirondack Preserve:

		Acres
Area January 1, 1919		1,721,598.12
Additions:		
Acquisition, purchase	47,000.25	
Losses	820.07	
Net gain		46,180.18
Total		1,767,778.30

Catskill Preserve:

Area January 1, 1919		116,724.12
Additions:		
Acquisition, purchase	2,335.89	
Losses	287.50	
Net gain		2,048.39
Total		118,772.51

Summary

Adirondack Preserve	1,767,778.30
Catskill Preserve	118,772.51
Grand Total	1,886 550.81

THIS FOREST ON THE SLOPES OF MT. SEWARD, BOUGHT DURING THE YEAR, PROTECTS THE WATERSHED OF THE RAQUETTE RIVER.

Public Use. When the Forest Preserve was established in 1885, one of the reasons advanced for its creation was that it might serve as a great vacation ground for the people of the State. At the time of the adoption of the constitutional provision protecting the Forest Preserve, in 1893, a similar reason was given. Recreation has had an important place in every discussion of forest policy since that time. It is accordingly somewhat surprising that in more than thirty years of continuous development of the Forest Preserve, during which time probably more votes were cast for the protection and extension of this property on account of aesthetic motives, than for any other reason, not a single vacationists' trail was ever built or marked on State property at State expense, not an open camp or fireplace was constructed by the State, nor any vacation map or guide book published by the State, nor in fact much else done by the State itself to make this big vacation country more accessible, more interesting, more usable, and better known to those whose property it is.

The Federal government long ago adopted the policy of broad public use in its administration of the national forests and parks, with the result that under the administration of the United States Forest Service and the Department of the Interior the building and marking of trails, the erecting of shelters, the improvement of camp sites, and the publication of helpful maps and guide books, are already very far advanced. In addition, the National Park Service of the Department of the Interior has organized a nation-wide educational movement for the fullest possible use and enjoyment of the great resources which the wonderful chain of national parks contains.

The people of New York State own a Forest Preserve which in size and beauty is comparable to any of the national parks. It does not contain startling and wonderful geysers like those of the Yellowstone. The Grand Canyon of the Colorado is a natural wonder not equaled anywhere else in the world. In the Forest Preserve we have no petrified forest like that of Arizona. In the Adirondacks, however, are the world's oldest mountains. Far back in the aeons of unrecorded time, beside which the longest

MORE SCOUTS CAMP TODAY ON THE ISLANDS OF LAKE GEORGE THAN IN THE ENTIRE FRENCH AND INDIAN WAR.

periods of history and tradition are as fleeting moments, the great crest of the Laurentian system of rocks, the Adirondacks, thrust its bold peaks above the primordial ocean. They were rough and jagged — the world's first Rockies. Geologists can even now trace out their extent and locate the approximate shore line of the primeval sea. Long afterward other convulsions upreared the ridges of the Appalachians and Rocky Mountains. These latter are veritable new comers. Through all of the long ages that have intervened, the rough peaks of the Adirondacks

AVALANCHE LAKE, IN THE DEEP CLEFT BETWEEN TWO OF THE STATE'S HIGHEST MOUNTAINS, WAS A HIGHWAY OF TRAVEL FOR THE INDIANS.

have been eroded and rounded, mellowed by time, and covered with the finest forests of the east.

The lapse of time, however, has not destroyed the primal grandeur of the Adirondacks. One need not go to the west for rugged mountains to climb or deep passes to thread. Mt. Marcy, called by the Iroquois "Tahawus," The Cloud Splitter, rises 5344 feet above sea level, high enough to cleave the clouds on all but the most perfect days. In every direction are peaks of only slightly lesser height, that taken together constitute the finest climbing country in the east. Immediately under the eastern foot of Marcy is Panther Gorge, of wild and rugged beauty. A little to the west, between Mt. Colden and Mt. McIntyre, is the deep cleft of Avalanche Pass, with the precipitous sides of the mountains rising on either hand, so that the only passage is over the water of Avalanche Lake itself. Avalanche Lake is the highest lake of any size in New York State, and in its deep mountain setting is one of the most secluded and inspiring pictures of the wilderness. Still further west is Indian Pass, highway of the Iroquois

INDIAN PASS WAS AN ANCIENT THOROUGHFARE FOR MOCCASINED FEET.

in their prehistoric journeys north and south. Their superstitution is said to have peopled it with stonish giants, supernatural beings, who lived upon human flesh. If one looked upon them, he immediately turned to stone, after the manner of the old Greek legend of Medusa of the snaky locks. This one tradition alone, with its striking similarity to that of ancient Greece, is enough to hold the interest of any student of folk lore, as he stands on the old Indian trail at the summit of the Pass, and looks back over one of the most beautiful scenes in the Adirondacks. The deep gorge of the Pass, the dark, sweeping, tree covered slopes of McNaughton, Henderson, and Santononi, and immediately at hand the thousand foot precipice of Wallface, make it a spot of singular interest and appeal, which, in common with the long chain of mountains on either side, should be carefully guarded as the heritage of every succeeding generation of citizens, and be made accessible to them to the fullest possible extent.

Further west is the lake region of the Adirondacks. Beginning with the Fulton Chain of Lakes at the south, it swings in a long series of lakes and rivers, broken only by short carries, to the Saranacs and St. Regis Lakes on the north. Through these lakes, trips of more than one hundred miles can be made in guide boats or canoes, with mountain climbing trips on either side that are of only slightly lesser interest than those of the great peaks around Marcy. Throughout the entire lake region the forests are among the finest in the Adirondacks.

Of all the 1500 lakes set within nearly 2000 peaks, there is none more beautiful, either in the Adirondacks or elsewhere, than Lake George, which Father Isaac Jogues first saw in 1646. He was taken through it as a captive of the Iroquois, and had just run the gauntlet and endured horrible tortures. Nevertheless, the beauty of the lake so impressed him that he immediately christened it Lac du Saint Sacrement. It has been likened to the lakes of the Swiss Alps, and called the "Como of the Wilderness". In early colonial history, it was an important link in the highway of travel north and south, which included the Hudson River, Lake George, and Lake Champlain, and has thus been inseparably associated with some of the most vital and picturesque incidents in early American history. More than one hundred of its islands are part of the Forest Preserve.

Au Sable Chasm has been called a veritable miniature of the Grand Canyon. While not State property, it is an important scenic feature of the mountains.

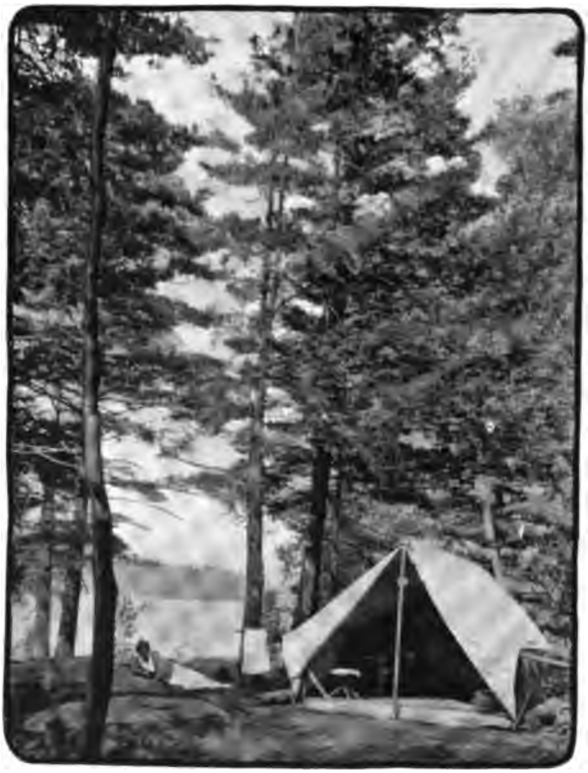
HAINES FALLS TYPIFIES THE EXQUISITE CASCADES OF THE CATSKILLS.

The Catskills are younger, but none the less beautiful and interesting in their different way. There Rip Van Winkle had his long sleep, and there each summer hundreds of thousands of tired city dwellers now find whatever rest and relaxation they ever get from the driving pace of city life.

In all parts of the Catskill Mountains, the scenery is justly celebrated. Slide Mountain, the highest mountain in the region, raises its majestic form to an elevation of 4204 feet, surrounded by a multitude of lesser peaks. Here are deep, cool valleys, rocky glens and gorges, whose silence is broken only by rushing cascades or by the murmur of woodland sounds. Indeed, on every side, the eye is greeted by an array of scenery not surpassed throughout the State. Platt Clove, Kaaterskill Clove, and Stony Clove, contain views as wonderful as any in the mountains, with forests that in many respects are comparable to those of the Adirondacks.

THE FOREST CLAD RANGES OF THE CATSKILLS ARE FAVORITE VACATION GROUNDS.

The Adirondack and Catskill State Parks are clearly quite as important and equally as interesting as any others in the broad scheme of parks and recreation centers which are rapidly being developed in all parts of the United States by one agency or another. In one respect they are far more so. They are within twelve hours journey of twenty million people, and constitute the wildest and most beautiful region that will ever be accessible to



CAMP SITES OF THE STATE ISLANDS IN LAKE GEORGE ARE USED ALL SUMMER

most of them. Nowhere in the world may be found such a combination of wild, grand scenery, and delightful easy travel, lying at the very threshold of so dense a population.

From this point of view they are accordingly the most important public vacation grounds in the United States. To make them more usable and enjoyable to these people is a public service of the greatest importance.

Two years ago the Commission began marking trails to all of the mountain tops upon which fire observation stations are maintained. Vacationists will now find at the points where these trails leave the highway a little sign giving the name of the mountain station, and bearing the words, "Public Welcome" On the tops of these mountains, the observers each season now welcome more than twenty thousand people, point out to them the interesting features of the landscape, outspread before them, and deliver to them little homilies on fire protection. The actors in the Commission's fire protection film are continually being recognized by audiences in every part of the State, so frequently, indeed, that it has come to be quite commonplace. It is an indication that the Forest Preserve has come to hold a very important place in the life of the people of the entire State, and is no longer unfamiliar to large numbers of them.

THE HANGING SPEAR FALLS ON THE OPALESCENT IN THE HEART OF VICTORY MOUNTAIN PARK.

The Commission believes that the work of improving and marking trails, the building of open camps and the construction of fireplaces throughout the Forest Preserve should now be undertaken on a scale commensurate with the great use that the people are making of this public property. The Preserve should be made more interesting and accessible to the people, as a service to which they are well entitled. The building of fireplaces and the holding of much of the travel to definite lines should also be looked upon as an important measure of fire protection.

In the construction of trails, it will be possible at many points, by bending the trail to one side, or by a little lopping of branches or trees, to open vistas of entrancing beauty, which would otherwise be passed by vacationists without knowledge of their possibilities. The opening of such vistas may be called a landscape development of the park, which does nothing to the landscape itself, but rather puts the travelers in strategic position for appreciation of the natural beauties of the country.

SCENERY INCOMPARABLE ELSEWHERE IN THE EAST IS FOUND AMONG THE PEAKS THAT CLUSTER AROUND MARCY.

An appropriation of $5,000 for this purpose each year would enable enough work to be done so that in a very few years the State would have the most accessible and most useful large wild forest park in the United States.

The islands of Lake George, of which 175 belong to the State, have become such popular camping places that it has been necessary to provide a special ranger for their protection and supervision. The ranger has constructed docks, breakwaters and other improvements, without, however, in any way marring their natural beauty, has laid out definite camp sites, constructed stone fireplaces, and cleaned out the old rubbish that in some places represented the accumulation of years. The result has been a large increase in the number of applications for camping permits, so that last summer for several weeks every site was occupied, and it has become clear that new ones must be laid out.

In the northwest part of the State, in the beautiful Thousand Islands region, the St. Lawrence Reservation, with its State islands and State owned points, fills a need for public camping sites, in the same way that the Lake George islands do. The Reservation has been improved with public docks, pavilions, and fireplaces.

THE SUMMIT OF MARCY IS THE GOAL OF AMBITIOUS CLIMBERS THROUGHOUT ALL THE WARM MONTHS.

Applications for permits to erect tent platforms about the shores of Lower Saranac Lake have been so numerous that practically every available camp site is now occupied every season.

Though some few sections of the Adirondack and Catskill Parks are now fully utilized, the public has scarcely begun to avail itself of the opportunities in the great extent of the territory. Because of the large area of the Forest Preserve, these opportunities are unlimited. What they must mean in the future to a population that is rapidly increasing can never be measured in dollars and cents.

Everywhere throughout the Forest Preserve region in both Adirondacks and Catskills, the use of this great vacation ground is increasing at a tremendous rate, until now the most important business of the whole region is that of caring for vacationists. More money is invested in hotel and other properties, more people are employed, more wages are paid, and the annual turnover is

LOG LEAN-TOS ARE THE STANDARDIZED SHELTERS OF THE FOREST PRESERVE.

greater, than in the entire lumber business, which once figured as the most important activity of the mountains. State roads and automobiles are largely responsible for this increase in the number of vacationists. As the State built roads have brought vacationists to the threshold of the Forest Preserve, the Commission feels that it is now incumbent upon the State to receive them, make them welcome, and extend that assistance which will make vacations more profitable and enjoyable. Acting upon this policy, the Commission began during the past year the publication of a series of recreation circulars and maps. Six of these circulars are already published, one more is on press, and will appear during the early part of 1920, and several others will be completed before the opening of the next vacation season. The circulars and maps already published or on press are as follows:

TRANSIENT CAMPERS ARE WELCOME WITHOUT PERMIT.

New York State Parks and Reservations. *Recreation Circular No.* 1. This circular contains a general synopsis of all of the parks, reservations, monuments, and landmarks owned by the State, with the name and address of the Commission having jurisdiction over it.

Public Use of the Forest Preserve. *Recreation Circular No.* 2. This circular gives rules and regulations governing the use of the lands of the Forest Preserve and the St. Lawrence Reservation.

Adirondack Highways. *Recreation Circular No.* 3. This circular shows the accessibility of the Adirondacks by rail, water and highway, and includes a sketch map in color of all of the principal routes.

Catskill Highways. *Recreation Circular No.* 4. This circular shows the accessibility of the Catskills by rail, water and highway, and includes a sketch map in color of all of the principal routes.

The St. Lawrence Reservation. *Recreation Circular No.* 5. This circular describes the St. Lawrence Reservation in detail, particularly with reference to the State owned islands and points. It is accompanied by a map in color, showing the location of the State property, and rail, steamboat and highway routes.

Lake George. *Recreation Circular No.* 6. The text of this circular is generally descriptive of the Lake George region, and covers in detail the State islands and the mountain climbing trails to the more important mountains surrounding the lake. It is accompanied by a map in colors showing the locations of all of the islands, the trails to the tops of the mountains, and the rail, steamboat and highway routes.

Adirondack Canoe Routes. *Recreation Circular No.* 7. This publication describes the canoe route of 125 miles from Old Forge through the Fulton Chain of lakes, Raquette Lake, Forked Lake, the Raquette River, Long Lake, the Saranac Lakes, and the St. Regis Lakes, to Paul Smith's with side trips on many lakes and rivers. It is accompanied by a map in colors, showing all of the waterways, the routes through them, the locations of the carries, and the points where State land borders upon the canoe route, and upon which canoeists may camp.

In addition there is in preparation and nearly completed a large map of the entire Adirondack region, giving every detail of interest to vacationists, including every lake, every river and stream of any size, every town and hamlet, every mountain of any consequence, with the elevations of the highest ones, the principal trails, and every highway, with differentiation between State and ordinary dirt roads. Railroads and steamboat lines are also shown. This map covers the whole northeast corner of the State, from Albany and Syracuse on the south, northward through the St. Lawrence Reservation, and east to Rouses' Point, Lake Champlain, and Lake George. It is intended to be the best and most complete vacation map of the country yet compiled. On account of lack of funds sufficient to publish it, the Adirondack Resorts Association have contributed $1,000 toward its expense, in the same way that the railroads of the country bore a large part of the expense of the National Parks Portfolio, published by the Department of the Interior. A similar general vacation map is planned for the Catskill Forest Preserve region.

IN A FEDERAL FOREST PRESERVE OF THE WEST, MADE ACCESSIBLE BY GOVERNMENT ROADS AND TRAILS.

The Commission has suggested to the various commissions having jurisdiction over other New York State parks and reservations that recreation circulars, similar in general character, be published for the properties under their control, and a number of these commissions have received the suggestion favorably. It is thus anticipated that eventually there will be published in uniform style a comprehensive set of publications, dealing with the more important of these properties. The service which such a series of publications can render to the people of this and other states and to the industries of the State that depend for their prosperity upon caring for vacationists, is quite immeasurable.

Arrows Welcome and Guide the Vacationist to Every Mountain Station.

The register of guides, published in accordance with an act of the last Legislature, is also issued in the same style as the recreation circulars. In spite of the fact that the register of guides is not yet complete, and the first list was not published until after the close of the summer season, the applications for copies of the register are nevertheless continuous, and it is apparent that publication of such a list of competent guides will be very much appreciated by people using the woods.

Other publications in preparation include one on Cuba Reservation, another on the trails to the top of Marcy and other surrounding peaks, one on winter camping and tramping in the Forest Preserve, which is becoming increasingly popular, and others on camping and tramping trips through various parts of the Preserve.

The great demand for the circulars already issued has been surpassed only by the appreciation shown by the recipients. The letters received from them have indicated clearly that this work, for which the public has long been waiting, comes now at the psychological moment after the termination of the war.

Protecting Lake George Islands. Very substantial progress has been made throughout the year in protecting the State islands in Lake George from erosion. The protection consists of stone rip-rap placed about the shores. In some instances, it is also possible to fill in behind the rip-rap with soil, particularly around the roots of the trees where the waves and high water have washed out the soil until the life of the trees is threatened. Much valu-

ALL CITIZENS ARE PART OWNERS OF THE WONDERFUL FOREST PRESERVE PLAYGROUND.

Reforestation and Protection of Lake George Islands Has Been Seriously Threatened By Artificial High Water.

able work has also been done in planting trees from the State nurseries on some of the islands. The planting of such trees is particularly important, since in many places the large number of people using the islands makes natural reproduction of the trees impossible, so that the only way to insure new growth for the future is to plant.

High water in Lake George, caused by the dam at the outlet of the lake, has resulted in extensive damage each spring for many years, even to the extent of threatening the loss of many of the most beautiful islands. This year for a long period an elevation of eighteen inches above the top of the dam was maintained in the lake, and this higher elevation, coupled with wave action, washed out soil, undermined trees, and upset the equilibrium which the soil on the islands had attained at normal water levels. The State has already spent approximately $19,000 in rip-rapping the shores of many of the islands, which have become one of the most popular camping centers in the entire Forest Preserve, and it was realized by the Commission that if such high water should be an annual occurrence hereafter, all hope of protecting those islands would necessarily have to be abandoned.

FLOODING STATE DOCKS AND ISLANDS AT LAKE GEORGE IS TO BE PREVENTED BY AN AGREEMENT FOR CONTROL OF THE LAKE LEVEL.

The matter was accordingly taken up for thorough study by the engineers of the Commission, and by the Attorney-General's office for examination of legal rights, with the result that the International Paper Company, owners of the dam at the outlet, voluntarily offered to enter into a definite agreement to use all of the facilities available at their mill to control the level of the lake, for a trial period of two years. These facilities include two waste gates that have seldom been used in the past, all of their water wheel units, and a third gate that has always been sealed before, but is now to be opened and provided with operating mechanism. The three waste gates will make it possible to discharge water in flood periods sixteen times faster than it could be spilled over the top of the dam when the depth on the crest is eight inches, a rate of discharge, according to the engineers of the Commission, which will make it possible to effectively control the level of the broad lake.

The agreement for a two year period of trial in the control of the level of the lake is made without prejudice to the rights of either party, with the understanding that at the end of that time other steps will be taken, based on data collected during the two year period, which it is expected will end for all time the annual damage to both State and private property on the lake.

JOHN BROWN FARM

The Old Homestead on the John Brown Farm has been extensively repaired, but care has been observed to keep it in its original appearance. The house is now occupied by the caretaker. The Commission believes, however, that it would be very desirable to build a separate caretaker's house, restore the homestead and its furnishings to as nearly as possible their original form, and keep the house hereafter as an interesting historical monument and museum. It has also been suggested that the barn and stables be removed from their conspicuous position. Moving them would undoubtedly add very materially to the attractiveness of the place, though it would alter somewhat the original appearance of the property.

ST. LAWRENCE RESERVATION

In common with the Forest Preserve and all other vacation centers, the St. Lawrence Reservation has been unprecedentedly popular during this last season. The State islands and points, of which there are ten, have been used constantly by a steady stream of picnickers and campers, and the ranger detailed there has been kept unusually busy supervising the property, and seeing that it is left by each party in a clean and sanitary condition. Experience has indicated that vacationists fully appreciate the necessity for care, when it is pointed out to them.

It is apparent that such supervision as the ranger gives has become an absolute necessity at all places where large numbers of people use State property.

During the year the roofs of the pavilions have been reshingled, and necessary repairs have been made to foundations, floors and steps. The roads leading to the properties have been greatly improved. Many new fireplaces have been built, and a new dock has been constructed on Long Point in Chaumont Bay. As soon as spring weather permits, the pavilions will be repainted. A new pavilion is now needed at Long Point, and a new dock at Burnham's Point.

CUBA RESERVATION

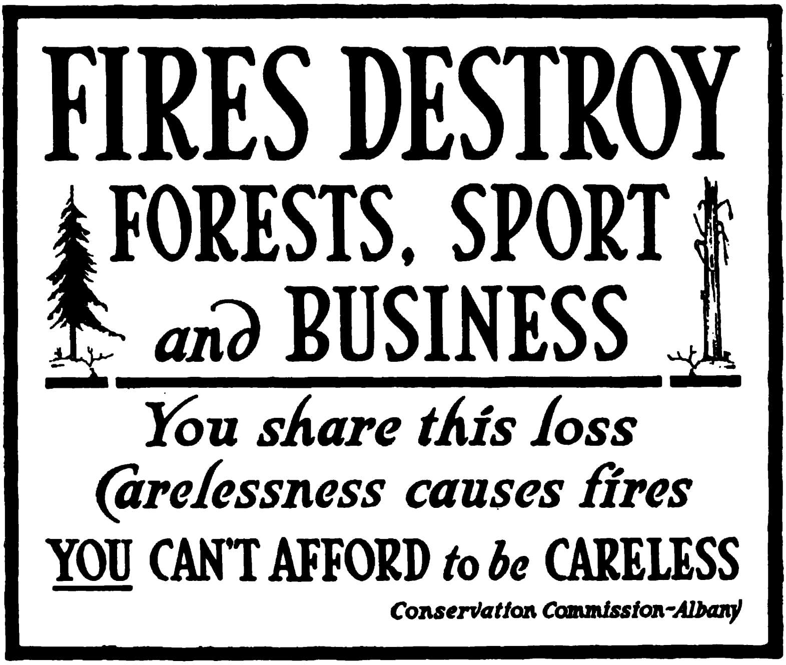
Cuba Reservation has had the most successful season in its history. Originally designed as a storage reservoir for a canal, but converted into a State reservation after the canal was abandoned, it is now operated under the jurisdiction of the Conservation Commission solely as a vacation resort, with cottage sites renting for the very reasonable sum of $15.00 per year. Out of a total of 272 cottage sites, 201 have been leased. The original five year period of the first leases expired this year, and nearly all of them were renewed. In addition many new leases were made. A large number of fine cottages have been built by the lessees, and the general appearance of the reservation has accordingly very much improved.

CUBA RESERVATION IS ONE OF THE VACATION CENTERS OF WESTERN NEW YORK.

The general boundary of the reservation was originally very irregular, and the reservation contained much land not needed for camp sites, but which was really desirable agricultural land. In accordance with the law, a part of this agricultural land has been sold or exchanged, the Commission receiving for 113.91 acres not necessary for reservation purposes the sum of $2,511 and also .85 acres of land.

A new road to develop other camp sites around the lake is being built at a cost of about $400.

Steps should now be taken to plant appropriate shade trees, and thus add to the value and attractiveness of this important vacation center for the western part of the State. It has returned to the State during the past year a net profit of approximately $2,000 after paying all expenses of a caretaker and necessary improvements.



FIRES DESTROY
FORESTS, SPORT
and BUSINESS

You share this loss
Carelessness causes fires
YOU CAN'T AFFORD *to be* CARELESS

Conservation Commission-Albany

Fire Signs Warn the Vacationist Upon Every Hand in the Forest Preserve.

FOREST FIRE PROTECTION

General. In spite of two periods of prolonged drought during the season of 1919, the record made in fire protection is cause for gratification and is proof of the efficacy of methods employed in combating the fire danger. Unusually heavy rainfall in the early spring produced a wealth of foliage, which operated to prevent most of the light rains during the summer from wetting the ground to any great extent. The comparative immunity from fire damage is thus due largely to the alertness of the protective force.

The customary methods of education of the public as to danger of forest fires were employed during the past year. In addition, the new recreation circulars contained conspicuous fire warnings on the covers and in various parts of the text. The number of forest fires caused each year by sportsmen and other pleasure seekers forms an unnecessarily large percentage of the total number of fires. Warnings in the recreation circulars are designed to reach just this class of people.

THE SPORTSMAN IS LEFT IN NO DOUBT OF HIS RESPONSIBILITY FOR FOREST FIRES.

During the month of August conditions of unusual drought, particularly in some parts of the Adirondacks, led the Commission to consider requesting the Governor to issue a proclamation forbidding hunting, fishing or camping in the woods, in accordance with provisions of the Conservation Law. The Commissioner took the public into his confidence and explained that all users of the woods would have to exercise the greatest possible care with fire in the woods if they wished to stay there. Fortunately, either through more precautions being taken by the people, or because of the subsequent well distributed rainfall, the situation was relieved during the latter part of the month.

Increasing difficulty has been encountered in securing proper maintenance of fire protective appliances on railroad locomotives and of guarding railroad rights of way, owing to unsettled labor conditions and the difficulty of securing materials. The Commission has nevertheless endeavored to maintain pre-war stand-

TRAVELERS IN THE FOREST PRESERVE ARE NOT PERMITTED TO OVERLOOK IMPORTANT OBJECT LESSONS.

ards and to secure improvements where possible. Over 4,700 inspections of locomotives have been made by our chief railroad inspectors, in addition to examinations made of nearly every mile of right of way of railroads operated through forest lands in all parts of the State.

The New York Central Railroad in 1918 applied to the Public Service Commission for relief from the requirment to operate oil burning locomotives on the Adirondack lines during the fire season. This application was opposed by the Commission because it had been found that employees often failed to maintain or use protective devices on coal burners, thus rendering those engines unsafe. The Public Service Commission in a decision handed down March 20, 1919, denied the application and issued the following statement:

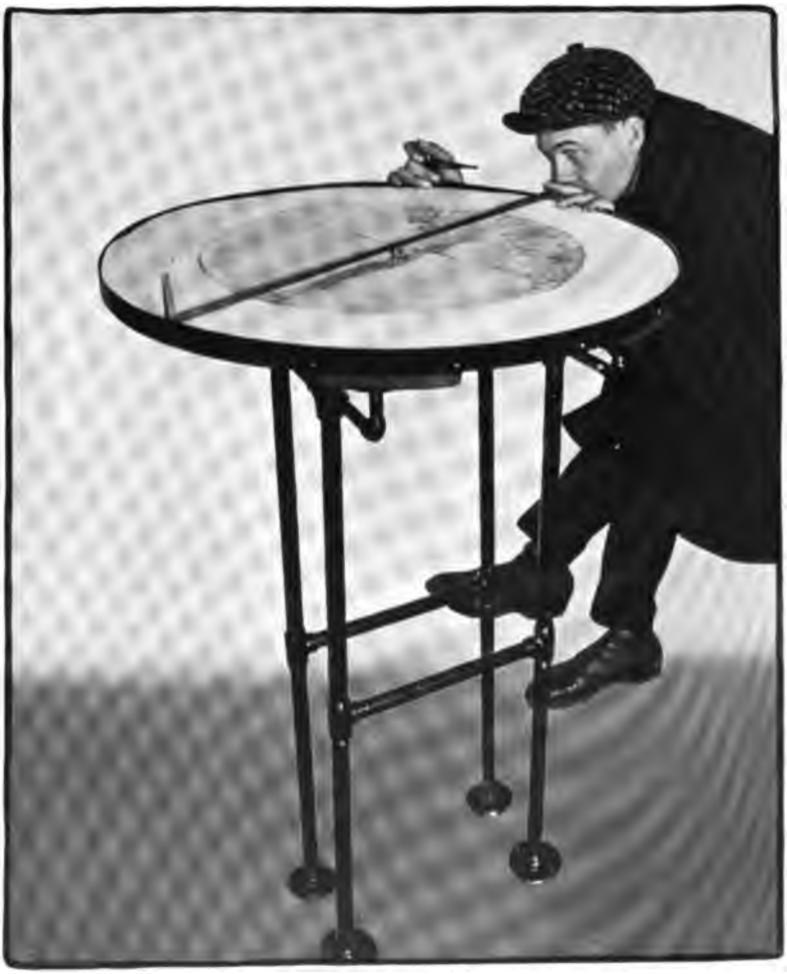
> "The human element now presents the crux of the case. The writer is individually of the opinion that in normal times there might be such assurances of proper construction, proper maintenance, and careful use as to justify the use of coal burning locomotives at all times; but the Commission is of the opinion that especially under the abnormal and peculiar conditions which have prevailed for some time in the past and which threaten to continue for a considerable period, the risk of faulty material, faulty workmanship, and faulty operation is too great to justify any modification of the order."

Fires of the Year. The fires of the year within the fire towns embracing seven and a quarter million acres in the Adirondack and Catskill regions totaled 266. These have been classified by causes as follows:

Smokers	77	Hunters	9
Locomotives	44	Burning rubbish	4
Fishermen	35	Burning buildings	4
Campers	24	Lumberjacks	3
Berry Pickers	21	Children	2
Burning brush	15	Steam roller	2
Lightning	13	Fire balloon	1
Incendiary	12		
		Total	266

Smokers caused 77 fires, which is by far the greatest number attributable to any one cause. The total acreage burned over by this class of fires was 1311 acres, which is 20 percent of the total acreage burned. Railroad locomotives were responsible for 44 fires, but they burned over only 360 acres, or 5 percent of the total burned acreage.

Fires caused by sportsmen, including fishermen, campers and hunters were 68 in number and burned 3033 acres of land — nearly half of the entire area damaged by fire. Pleasure seekers who go into the woods will do well to study these figures and consider just what their meaning is. They mean that the people who get the greatest enjoyment out of the woods, who, more than any others, are anxious for the protection of the forests, by their own carelessness are doing more than any others to destroy the forests.



EVERY MOUNTAIN OBSERVATION STATION IS BEING EQUIPPED WITH THIS RANGE FINDER FOR FOREST FIRES.

THE OBSERVER'S SHELTER ON THE TOP OF AMPERSAND MOUNTAIN WAS VISITED IN ONE SUMMER BY SIX HUNDRED CLIMBERS.

Timberland owners recognize that sportsmen through their carelessness contribute greatly to the fire hazard, and for that reason are restricting more and more the use of their land by the public. Sportsmen must bear this in mind and realize that their future privileges in the woods will depend upon their care with fire.

On pages 132 and 133 the fires of the year in the fire towns have been summarized and classified by counties, by causes, and by months of occurrence. The 266 fires reported burned 6550 acres and did damage to the extent of $3,825. The expense of fighting fires was $6,613.25.

The area burned and damage done are less than in 1918, and both are far below the average. The average area burned by each fire in 1919 was 24.6 acres. It is increased above the normal by a large fire which occurred in Lewis County late in June and which burned over an acreage equal to a third of the total area covered by the fires of 1919. This fire was promptly reported by several observation stations, but on account of very dry weather accompanied by high winds, it was impossible to check the fire until it had covered a large area. It was, however, confined to an old burned area, and to waste or denuded lands. Only 18 percent of the total acreage of 1919 fires was second growth, and only

Summary of Forest Fire Losses, 1919, by Counties

COUNTY	Number of fires	Total acreage burned	Total expense of fighting fires	Acres private land burned				Acres State land burned				Value of standing timber destroyed	Value of logs, lumber, etc., destroyed	Value of buildings fences, etc., destroyed
				Virgin timber	Second growth	Brush	Waste	Virgin timber	Second growth	Brush	Waste			
ADIRONDACKS														
Clinton	20	488	$279.20	......	247	27	214	......	......	......	......	$205.00	....	$55.00
Essex	25	74	790.39	......	14	53	7	......	......	......	......	60.00	$10.00	....
Franklin	31	96	535.55	......	......	70	18	......	4	2	2	25.00	....	....
Fulton	2	10	9.90	......	......	......	10	......	......	......	......	....	....	....
Hamilton	24	507	1,018.50	......	9	139	28	......	5	326	......	70.00	600.00	....
Herkimer	22	39	179.00	......	3	8	25	......	1	2	......	5.00	....	....
Lewis	16	3,060	1,659.07	......	223	2,270	517	......	10	40	......	1,100.00	....	....
Oneida	7	113	61.65	......	......	36	12	......	......	65	......	....	....	....
Saratoga	13	162	140.05	......	32	46	84	......	......	......	......	125.00	....	....
St. Lawrence	39	538	1,205.42	......	6	446	83	......	......	......	3	40.00	....	....
Warren	22	270	404.67	40	91	97	25	......	......	10	7	700.00	....	15.00
Washington	......	......	....	......	......	......	......	......	......	......	......	....	....	....
Total Adirondacks	221	5,357	$6,283.40	40	625	3,192	1,023	......	20	445	12	$2,330.00	$610.00	$70.00
CATSKILLS														
Delaware	9	118	$18.50	......	21	21	......	......	75	......	1	$115.00	....	....
Greene	6	60	61.65	......	42	8	10	......	......	......	......	40.00	....	....
Sullivan	6	45	19.20	......	1	44	......	......	......	......	......	....	....	....
Ulster	24	970	230.50	......	405	495	20	......	......	50	......	610.00	$50.00	....
Total Catskills	45	1,193	$329.85	......	469	568	30	......	75	50	1	$765 00	$50.00	....
TOTALS														
Adirondacks	221	5,357	$6,283.40	40	625	3,192	1,023	......	20	445	12	$2,330 00	$610.00	$70.00
Catskills	45	1,193	329.85	......	469	568	30	......	75	50	1	765.00	50.00	....
Grand totals	266	6,550	$6,613.25	40	1,094	3,760	1,053	......	95	495	13	$3,095.00	$660.00	$70.00

Summary of Forest Fire Losses, 1919, by Causes

CAUSE	Number of fires	Total acreage burned	Acres private land burned				Acres State land burned				Value of standing timber destroyed	Value of logs, lumber, etc., destroyed	Value of buildings, fences, etc., destroyed
			Virgin timber	Second growth	Brush	Waste	Virgin timber	Second growth	Brush	Waste			
ADIRONDACKS													
Smokers	69	1,136	......	357	476	282	......	......	11	10	$1,270.00	$600.00	$65.00
Locomotives	25	209	......	112	1	96	......	......	......	......	80.00	....	5.00
Fishermen	35	2,780	......	101	2,035	592	......	10	42	......	605.00	....	....
Campers	22	7	......	3	1	......	......	1	1	1	60.00	....	....
Berry Pickers	19	128	......	23	93	12	......	......	......	......	150.00	....	....
Burning Brush	9	36	......	1	15	20	......	......	......	......	....	....	....
Lightning	13	549	......	5	218	......	......	......	325	1	....	....	....
Incendiary	7	53	40	10	......	......	......	2	1	......	110.00	....	....
Hunters	8	232	......	......	226	......	......	6	......	......	....	....	....
Burning rubbish	3	10	......	......	......	10	......	......	......	......	....	....	....
Burning buildings	3	41	......	......	41	......	......	......	......	......	....	....	....
Lumberjacks	3	5	......	......	......	4	......	1	......	......	....	....	....
Children	2	110	......	3	36	6	......	......	65	......	30.00	....	....
Steam rollers	2	1	......	......	......	1	......	......	......	......	....	....	....
Fire balloon	1	60	......	10	50	......	......	......	......	......	25.00	10.00	....
Total Adirondacks	221	5,357	40	625	3,192	1,023	......	20	445	12	$2,330.00	$610.00	$70.00
CATSKILLS													
Smokers	8	175	......	71	94	10	......	......	......	......	$40.00	....	....
Locomotives	19	151	......	21	54	......	......	75	......	1	140.00	....	....
Campers	2	4	......	4	......	......	......	......	......	......	25.00	....	....
Berry pickers	2	37	......	6	31	......	......	......	......	......	....	....	....
Burning brush	6	403	......	315	68	20	......	......	......	......	510.00	$50.00	....
Incendiary	5	413	......	52	311	......	......	......	50	......	50.00	....	....
Hunters	1	10	......	......	10	......	......	......	......	......	....	....	....
Burning rubbish	1	*	......	......	......	......	......	......	......	......	....	....	....
Burning buildings	1	*	......	......	......	......	......	......	......	......	....	....	....
Total Catskills	45	1,193	......	469	568	30	......	75	50	1	$765.00	$50.00	....
TOTALS													
Adirondacks	221	5,357	40	625	3,192	1,023	......	20	445	12	$2,330.00	$610.00	$70.00
Catskills	45	1,193	......	469	568	30	......	75	50	1	765.00	50.00	....
Grand totals	266	6,550	40	1,094	3,760	1,053	......	95	495	13	$3,095.00	$660.00	$70.00

*Lethan one acre burned.

Fires Reported from Observation Stations in 1919

STATION	Fires reported, 1918	Fires reported, 1919
Adams	....	3
Ampersand	8	8
Arab	3	3
Azure	14	23
Bald	19	8
Balsam Lake	17	4
Beaver Lake	4	7
Belfry	4	2
Belleayre	18	3
Black	4	2
Blue	3	4
Boreas	7	3
Cat	9	14
Catamount	14	15
Cathead	9	5
Crane	7	5
DeBar	4	4
Dunbrook	1	....
Fort Noble	....	1
Gore	2	3
Hadley	5	4
Hamilton	11	3
High Point	16	5
Hunter	1	2
Hurricane	2	7
Kempshall	5	4
Loon Lake	8	4
Lyon	3	3
Makomis	3	3
Mohonk	14	3
Mooshead	9	15
Moose River	2	5
Mt. Morris	3	8
Owlshead	7	6
Pharaoh	4	5
Poke-O-Moonshine	2	....
Prospect	8	5
Rondaxe	4	9
St. Regis	1	5
Snowy	6	....
Stillwater	16	17
Swede	....	4
T. Lake	3	....
Tomany	4	1
Tooley Pond	24	2
Tremper	17	6
Twadell	9	3
Vanderwhacker	6	6
Wakeley	....	....
West	1	5
Whiteface	6	10
Woodhull	5	7
	352	274
Long Island		
Flanders	....	29
Telescope	....	134
Grand total	352	437

40 acres of virgin timber was damaged. The rest was brush and waste or denuded land, most of which had been burned over previously, so that the damage to standing timber was relatively small.

June and August were the worst months for fires. The former was unusually hot and dry, while the latter produced in the northern Adirondacks the worst drought of many years.

Violations of Fire Laws. A notable reduction has been made in the number of cases of violations of the laws relating to slash disposal and forest fires. The number of cases reported has been reduced from 99 in 1918 to 67 in 1919; cases closed drop from 109 in 1918 to 68 in 1919. The violations are summarized in the following table:

Summary of Violations of the Fire Laws
Dec. 1, 1918, to Nov. 30, 1919

OFFENSE	Total number of cases reported	Number of cases closed	Amounts recovered
Failure to lop tops	38	39	$660 00
Causing forest fires	16	19	203 18
Fires to clear land	13	10	62 50
Totals	67	68	$925 68

Equipment. The Department has constructed or assisted in the construction of 15 miles of new telephone line in order to provide better service and to tap new territory where additional telephone facilities were needed for fire protection.

A determined effort has been made during the year to improve the equipment at the fire observation stations. New cabins have been erected for the observers at five stations, namely, Azure, Whiteface, Vanderwhacker, Kempshall and Pillsbury. The last named station is a secondary station installed by the Department under an agreement with the Champlain Realty Company, whereby the latter is to provide an observer to be on duty during periods of dry weather.

THE OBSERVER'S CABIN ON THE SIDE OF AMPERSAND MOUNTAIN.

Eleven new steel towers were purchased during the year for the observation stations named in the following list.

Steel Towers Erected in 1919

Adirondacks

Boreas
Moose River
West
Tooley Pond
Beaver Lake
Hurricane
Owls Head
Whiteface

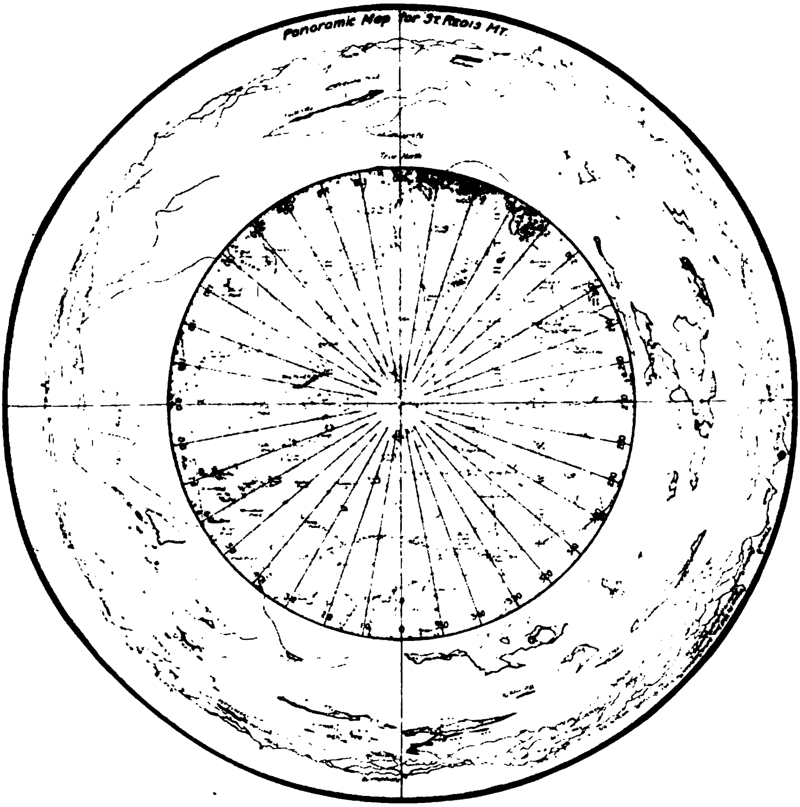
Catskills

High Point
Balsam Lake
Twaddell Point

All of these towers have been erected in place with the exception of those on Balsam Lake Mountain and West Mountain. These last will be erected early in the spring of 1920, and when they are completed there will remain only four of our 54 observation stations not equipped with standard steel towers with enclosed shelters.

Wooden stairways have been built for all the first steel towers purchased in 1916, which were originally provided only with ladders.

Everyone who has looked out upon the distant view visible from a mountain top has experienced a difficulty in placing exactly the various features of the landscape, according to the map. Maps are designed from a view-point directly above, as it were, a situation which is never duplicated under natural conditions — except, perhaps, from an airplane. When, in the past, a fire observer has been desirous of communicating to the forest ranger by telephone the exact location of suspicious smoke, he has, in many instances, been unable to describe its exact whereabouts in a manner sufficiently exact to secure the most expeditious control of the blaze. During the past season, therefore, many of the fire observation stations have been provided with a special circular table, upon the top of which is placed a combina-



WITH A PANORAMIC MAP AND A SIGHTING DEVICE EVERY FIRE MAY BE LOCATED WITH UNFAILING ACCURACY.

tion map, showing in the usual topographical map form, in the center, the territory visible, and in a band around the perimeter an outline of the skyline and landscape as it appears from the tower. If only a corner of a lake appears behind the mountain, it is so represented, and the relation of the various peaks to one another are shown as they appear to the eye and identified by name.

The observer has only to look over the top of his new map table in any direction, and he will see the panorama duplicated. Over the map is fitted a piece of heavy plate glass to protect it from wear. A hole in the center of the glass permits the use of the alidade, or sighting device, to aid in the more accurate location of fires.

The new maps not only greatly increase the efficiency of fire detection, but are also of great interest to tourists and other visitors at the stations, who are invariably anxious to learn the country and inform themselves as to the names of the mountains, lakes and other points of interest.

The preparation of these panoramic maps is a work taking considerable time, but the results are well worth the time and expense required. During 1919, panoramic maps have been prepared for 15 observation stations, namely: Arab, Black, Blue, Catamount, Cathead, Hamilton, Makomis, Moosehead, Poke-O-Moonshine, Prospect, Rondaxe, St. Regis, Snowy, T-Lake and Tomany. Of these maps, those on Arab, Blue, Catamount, Makomis, Moosehead, Rondaxe and St. Regis have been mounted in position on the tables.

The mountain station trails are being constantly improved to facilitate the climbing of the mountains by visitors, in order that they may avail themselves of the recreational and educational opportunities offered by a visit to one of these stations.

The location of the Moose River Mountain Station has been changed from its old location on the highway from McKeever to Port Leyden to a hill between Fulton Chain and Big Otter Lake, from which a far better view is obtainable.

Investigation has developed the fact that a considerable area on the southerly slope of the Catskills proper is not adequately covered by any of the existing observation stations. After a careful reconnaissance, a site for a new station was finally selected on Red Hill in the town of Denning, Ulster county, near the village of Claryville, and a sixty foot steel tower has been ordered. It will be erected and the station installed early in the season of 1920.

Long Island Fire Protection. Means for prompt detection of forest fires on Long Island were provided by the two observation stations established in the late fall of 1918. Those stations were placed in operation in March, 1919, and have proved their usefulness in their first season's existence. The observer on Telescope Hill reported 120 fires between March 17 and June 15.

While the operation of the observation stations has done a great deal to secure more prompt action on forest fires by town officials, it is apparent that better organization of the town fire wardens and forces available for fire fighting is necessary if we are going to secure adequate fire protection. A more vigorous prosecution of violators of the fire laws is also essential. Plans have been made to develop these phases of the work on Long Island in the near future.

THE FIRE TOWER ON TELESCOPE HILL, LONG ISLAND, COMMANDS A VIEW FROM SOUND TO OCEAN.

Weeks Law. A reduction was made on July first in the funds allotted New York State by the Federal Government under the Weeks Law for cooperative fire protection on the watersheds of navigable streams. The salaries of twelve observers were paid out of this allotment in the first part of the season, while the reduction forced us to reduce this number to six during the latter part. A total of $5,572.33 was expended.

RATING OF RANGERS

The results attained through the rating of the forest rangers as to efficiency, and basing promotions upon the ratings, have proved so satisfactory that they are being continued. The system of monthly efficiency reports provides a fair and just method of promotions, and is acceptable to the Commission and its employees alike.

SEVEN AND ONE-HALF MILLION TREES WERE SHIPPED FROM THE STATE NURSERIES IN 1919.

REFORESTATION

General. A new high record in the reforestation of denuded land of the Forest Preserve has been made during the past year, and the reforestation of both State and private land has been greater than in any year except 1915. The total output of trees was 7,532,955, which means an area of approximately 7,500 acres placed under tree growth. The Commission feels that this is a particularly satisfactory showing, in view of the great difficulty of securing labor. It should be possible to very materially increase this work by more intensive methods, which will be discussed more fully under the head of State-wide forestry, on page 160.

Nurseries. Much difficulty has been experienced during the last three years in obtaining seeds of certain desirable species, particularly red pine. This has made it necessary to use larger quantities of seed of other species, more readily available, in order that the output of the nurseries may be kept up, and even increased. This is a condition that must occasionally be met in the operation of nurseries. It is due to natural causes, over which no one has control.

Continued expansion of the work of reforestation has made it necessary to make a number of changes in the nurseries, for the purpose of placing them on a more productive and permanent basis. Some of them have been enlarged in order that we may have the area necessary for a crop rotation, and thus avoid exhaustion of the nursery soils. With this enlargement, it is possible to use the land in accordance with a three year crop rotation, which will permit a cover crop on the land every third year.

The Saratoga nursery has been moved to a site about one mile further south, along the State road leading from Saratoga to Ballston Spa. A very attractive piece of land of considerable size, owned by the State, is available for nursery use. The seed beds were prepared on this area last spring, and during the summer several acres were broken, graded, and made ready for transplanting trees next spring. It is now expected that this nursery will become the main distributing point for trees in the eastern part of the State.

The Comstock nursery was this spring moved to a new site, located on higher ground back of the prison. Although less area is available, this will not be a disadvantage, because labor conditions at that place made it necessary to reduce the size of the nursery. The soil on the new site is better adapted for growing trees, as it is not so heavy, and will be more accessible during wet weather.

Moving the Salamanca nursery to a more central location is contemplated, although no new site has yet been definitely determined upon. The relocation of the nursery is to be recommended, however, as most of the trees now produced in the Salamanca nursery must be shipped to points east of Binghamton and Rochester.

The Central Islip nursery will be maintained at its present area, and will be used primarily for the production of trees to reforest denuded portions of Long Island.

Reforesting the Forest Preserve. A total of 5,160,100 trees were planted this year on the Forest Preserve. This is an increase of 947,100 trees over last year, and means a total area of State land brought under tree growth during the year of approximately 5,160 acres. This is the first time that an area of 5,000 acres of State land has been reforested in any one year. It was made possible by placing the general supervision of the work in charge of the five district rangers, instead of under the general supervision of a single forester operating from Albany. These five rangers were able to keep many planting gangs at work in different places, thus utilizing for short periods local labor during the season when other work was not pressing. The system has worked out so satisfactorily that it will be continued hereafter.

Planting by State Institutions. The use of trees by State institutions has decreased yearly because of the fact that the greater part of their non-agricultural lands has already been reforested. This year State institutions used only 107,800 trees, as compared with 1,156,460 in 1915. The total number of trees supplied to State institutions since the nurseries were first operated has been 5,791,844, which represents a reforested area of 5,700 acres. It is thus possible to view with considerable satisfaction the approaching completion of this phase of the work of making the State's waste land productive.

Sales of Trees. The work of reforesting by private land owners is being held in check by the scarcity of labor and high wages. The sales of trees for the current year were accordingly less than those of a year ago, and amounted to only 2,265.055 trees, a decrease of 332,730.

WHITE PINE BLISTER RUST

General. Work on the control of White Pine Blister Rust has been continued during the year following the general plan of former years, except that some changes have been made as the result of past experience. Much better results have been accomplished this year on account of the lesson learned in former years, and because of the fact that we are now able to employ as foremen men who have become experienced and expert in this line of work. The eradication work has been continued; some experiments have been conducted; much publicity has been given the subject; control measures have been taken; and considerable scouting has been done to ascertain the spread of the disease.

Eradication. The removal of ribes (currants and gooseberries) on State land where white pine plantations have been made or are anticipated was done at Chubb Hill, Ray Brook, Boreas River, Axton and Indian Lake. The areas adjacent to the State nurseries at Comstock, Saratoga and Lake Clear have been cleaned of ribes. Other State lands have been covered at Minerva and on the islands in Lake George.

The work on private land has been conducted on a cooperative basis, the State spending an amount equivalent to that subscribed by a community, or equal to the value of work undertaken by private owners. The one great difficulty in blister rust control has been overcome, namely, the former lack of cooperation. The Commission has been able to organize sections and obtain the cooperation of all land owners and thereby bring about proper eradication on large areas. It is readily appreciated that this disease cannot be controlled on small areas, except at comparatively large expense, while the object can be attained through the eradication of ribes on large areas at much smaller cost. The results obtained in the communities where work has been done have met the unanimous approval of land owners, because it has been demonstrated that the ribes can be eliminated at a reasonable cost, and the owners now realize that without such eradication this disease endangers the valuable white pine. They have shown an unexpected desire to cooperate with us in this important work. The Lake George Association and Schroon Lake

BLISTER RUST, IF UNCONTROLLED, WILL DESTROY THE WHITE PINE INDUSTRY THROUGHOUT THE STATE.

Association have voluntarily raised a large sum of money, which has been used, and, in other cases, land owners have contributed funds or have supplied labor equivalent to their share of the cost. In following out this plan, whatever amount is expended privately is duplicated by the State and the total of the State and private funds is duplicated by the U. S. Bureau of Plant Industry.

The results of this work during the year are as follows:

Blister Rust Control Work, 1919

ERADICATION AREA	Acreage	NUMBER OF RIBES PLANTS DESTROYED		Cost per acre
		Wild gooseberries	Skunk currants	
State Land				
Chubb Hill	1,170	25,146	16,316	$3 20
Ray Brook	634	26,711	44,164	
Axton	121	1,149	....	
Indian Lake	559	34,887	122,075	2 97
Wilmington	1,340	48,669	15,216	1 81
Boreas River	1,350	52,630	126,804	3 32
Comstock	216	2,449	3	1 55
Saratoga	150	247	....	86
Adirondack	2,147	134,579	53,975	2 91
Private Land				
Highlands	2,924	475,889	74,203	2 50
Lewis	1,542	48,318	....	1 53
Deerhead	472	....	....	61
Lake George — West side	5,419	329,336	3,310	4 83
Huletts	1,798	158,765	1,226	3 12
Shelving Rock	833	78,795	178	7 34
Schroon Lake	755	41,651	17,731	1 21
Paradox	424			1 88
Willsboro	640	46,774	....	1 75
Totals	22,494	1,505,995	475,201	$3 20

The above figures do not include the eradication on 700 acres of land in the Town of Minerva, where more than 80,000 currant and gooseberry bushes were removed. School boys from 18 to 20 years of age being employed as an experiment in an endeavor to develop an additional supply of labor.

The result of field investigations shows that under our present methods a good foreman and crew of men will, the first time over a piece of land, remove from 85 to 95 percent of all the ribes bushes. Those which are left are small and inconspicuous and are usually covered by other vegetation. Actual counts which have been made show on the whole an average of 92 percent removed the first time, and that all can be removed by the fourth time the ground is covered. Furthermore, the important fact has been ascertained that during the first time over, 98 percent of the leaf surface of ribes can be removed and destroyed. The remaining two percent of very small leaves is covered with vegetation, and therefore is a very small factor in the spread of the rust. This statement is based upon an actual count of leaves on bushes removed where experiments were conducted, and is based upon areas sufficiently large and typical to make the statement reliable. The reduction of the leaf surface of ribes to such a small and insignificant quantity in covering the ground once gives the greatest encouragement and leads to the belief that there is no question but that this work can be conducted at a fair price and with reasonable assurance of safety, and that white pine can be grown to maturity and remain, as it always has been, one of our most important timber trees.

Experimental Work. The work at Wilmington, where a plantation was made for the purpose of attempting to ascertain the rate of spread of the disease has been continued, and scientific work in connection therewith has been conducted by the U. S. Bureau of Plant Industry.

· **Scouting.** During the past summer considerable field work has been done in the central, southern and western counties of the State, for the purpose of ascertaining any places, other than those already known, where blister rust in either of the stages can be located. In this connection, much assistance has been given by the State Department of Agriculture.· The disease has been found for the first time this year at the following places: One mile south of Chittenango Falls in Madison County; at Lake Bonaparte, Lewis County; Pulaski, Oswego County; Seneca Castle, Ontario County; Chippewa Bay, St. Lawrence County; Newark, Wayne County; Stanley, Ontario County (2); Lynbrook. Long Island; Clifton, Monroe County; about three and one-half miles southeast of Binghamton, Broome County; Warsaw, Wyoming County; North Brighton, Genesee County; Auburn, Cayuga County; and Oyster Bay and Glen Cove, Long Island. In nearly every one of these cases, the infection was found on black currants. Steps should be taken at once to cause the removal of all cultivated black and flowering currant bushes in this State. The studies which have been made show that they are far more susceptible to the disease than any other species of ribes. As a commercial proposition they are of but little consequence, and their removal from lands outside the fruiting currant districts will not cause much loss.

Fruiting Currant Districts. Steps will be taken during the winter to delineate the fruiting currant districts, as defined by law, in which territories the pine is to be removed and the currant industry allowed to proceed in its proper development.

STATE-WIDE FORESTRY

General. In an address before the American Lumber Congress in Chicago on April 16, 1919, Colonel Henry S. Graves, Chief of the United States Forest Service, proposed a nation-wide lumber and forest policy to check the waste of forest resources, and to provide for the lumber needs of the future. The facts presented by Colonel Graves upon that and subsequent occasions, and the constructive forestry program which he has proposed, have commanded universal attention among foresters, lumbermen, and users of wood generally, who have recognized that the country has already reached the point where far more effective steps must be taken than heretofore in forestry matters. Some of the salient facts brought out by Colonel Graves are given in the following paragraphs:

" The dissipation of our forests goes on with no let up, and still for the most part without any provision for the continuance of the forests after lumbering. Exhaustion of local forest supplies, the closing of industries dependent on them, the embarrassment for supplies of the pulp mills and other consumers using special classes of forest products, the generally mounting prices to consumers, are other factors which are calling sharp attention to the effect of forest destruction, and are causing increasing public uneasiness.

" Neither the lumber industry nor the public can ignore the fact that the great fundamental problems, which not only involve the permanence and stability of the interests dependent on our forests but also gravely affect the national welfare, are not being solved.

" Forest depletion is injurious long before the last tree is cut and long before all but the last center of production is exhausted.

Oftentimes our minds are centered on total production and general markets, overlooking the relation of the forest and its industries to the life of the regions and the communities in which they are located. When local resources are so depleted that industries close, the question of vanishing supplies takes on a new significance. And that is exactly what is happening in hundreds of communities. The forest supplies are used up; the chief industry, a sawmill, a box factory, or a wood-working establishment closes. Subsidiary industries dependent on the primary undertaking have to close also. And what is more, the land formerly producing the timber, if non-agricultural, is left in an unproductive condition and a burden for many year~ on the community.

THE DEMAND OF INDUSTRIES FOR WOOD MAKE FOREST RENEWAL AND GROWTH A QUESTION THAT CAN NO LONGER BE IGNORED.

"Many important wood-using industries are already embarrassed for supplies. Especially acute is the situation faced by the manufacturers of news print paper in the Northeast, in the Lake States, and elsewhere. Enormous investments have been made in permanent mills, water power, and equipment. The local sources of supply of pulp wood are becoming rapidly exhausted. Because of this situation and because of the difficulties in obtaining raw materials from Canada, we have seen the new construction of mills taking place only in Canada, largely with American capital.

" Other industries using special wood products are equally embarrassed. Some are able to secure materials from a distance; others have to close and move to new sources of supply.

" Because there is still an abundance of timber in the far West, the East and central West cannot complacently see the basis of their own industrial prosperity destroyed. In short, we have in many localities a very real problem of shortage of forest supplies and very real consequences of forest depletion.

" The problem of supplies does not merely concern the amount and character of timber now standing; it concerns, as well, the production of new crops of timber by growth. I would have little concern about the amount of timber used if we were growing new stands in place of the old. We have enough non-agricultural land to produce for all time lumber in abundance for ourselves and for export. But this would require keeping our forests in a productive state after lumbering. We are not doing that. Our forests are steadily deteriorating under cutting and fire. No effort is made for replacement after cutting. Fire protection is confined to old timber. Young growth and cut-over lands are not being protected. Accidental stands following cutting and fire are generally poor in quality and species and of low prospective yield. We are still drawing for the most part on original sources of supply. Failing to replace these, we are steadily losing ground. We are actually using up our forests, just as we would use up a deposit of coal, when we might have been renewing them.

" The question of forest renewal and growth is one that can no longer be ignored. It is not only of interest to the public but it is of vital concern to the owners of timberlands. It may be said that reserves of timber ought to be held by the public rather than by private owners. A good many assert that the growing of timber is wholly a public function; that, as most timberland owners have bought their property to exploit their timber, not to grow trees, forestry and forest growth are not matters of private concern. But the fact remains that the bulk of the timber of the country is privately owned, three-fourths of it. It is an important fact also that the bulk of the land that must grow the timber of the future is privately owned.

"On the other hand, the public has a very essential interest in the question of keeping the lands in a producing condition so as to render a maximum of service, in supporting industries and local communities, and in serving to support through tax levies public enterprises of various kinds.

"We have, then, a perplexing dilemma. On the one hand the public is deeply concerned that the private forests be handled in a way to provide for forest renewal and growth. We have, on the other hand, the timber owners struggling under a responsibility that has never been fully sensed or accepted. The result is that while consideration of public interests demands that something be done, nothing substantial is actually being accomplished. It appears to me that the situation is an impossible one, that cannot long continue. Both the industry and the public have a definite decision to make. As I see it, either private owners must assume the full responsibility of properly caring for their timberlands, including protection and forest renewal; or the public must take over the responsibility that it once had and surrendered; or *the public must share with the owners both the responsibility and the burden of securing the objectives that are essential to safeguard the public welfare.* My own view is that the last is the only fair and practical method from the standpoint of all concerned.

LONG ISLAND'S BARREN WASTES ARE THE RESULT OF SUCCESSIVE FOREST FIRES.

"The problems which I have set forth touch many interests, both public and private. Their solution involves Federal and State legislation, and also involves cooperation between public agencies and the lumber industry. The different problems are closely interrelated one with another. Moreover, action in one section of the country concerns the interests of other regions. These circumstances make it clear that for a final solution there must be a far-reaching program that will enable the Federal Government, the States, communities, and the industrial forces to unite in a common effort."

Timber Shortage in New York State. Investigations made during the war by this Commission, in cooperation with the United States Forest Service, for the purpose of locating available supplies of timber to meet the urgent demands of the army, developed a situation so serious in New York State that it threatens the absolute existence of some of the most important industries within our borders — those that depend for their continuance upon unfailing supplies of forest products.

PLANTED PINES WILL THRIVE ON LONG ISLAND WHEN FIRE IS KEPT OUT.

In no state is the situation more critical than in New York. This is due to the fact that New York is the greatest user of wood of any state, the total annual consumption amounting to over 1,750,000,000 board feet of lumber, in addition to 1,000,000 cords of pulp wood, over 130,000 cords for wood alcohol and other products of distillation, and enormous quantities of other material for railroad ties, cooperage, poles, and fuel wood. It has been estimated that the annual lumber bill of the State is over sixty million dollars, about two-thirds of which goes outside of the State. In spite of the fact that approximately two-thirds of the annual lumber needs are met by importation, it is nevertheless true that we are actually cutting within the State from three to five times more timber than is grown here each year. Statistics of forest products for 1918, which is the last year for which they have been compiled, show that in that year we cut 762,289,934 board feet, in addition to 18,651,346 miscellaneous pieces, like posts, poles, laths, shingles, etc.

LONG ISLAND'S SANDY SOIL IS CAPABLE OF GROWING A FINE, MERCHANTABLE CROP OF WHITE PINE.

Our forests are thus rapidly vanishing, and it requires little more than arithmetical computation to determine the time when timber production in New York State will be a negligible industry, with the inevitable result that the vital manufacturing establishments which depend upon available supplies of wood will migrate to other fields. It is clear that the remedy for this situation is one of the most fundamentally important problems with which we have to deal in New York State to-day.

State-Wide Forestry Necessary. The menace of a wood shortage, which investigations have disclosed, is so imminent, and the need for immediate administrative steps to replenish our supply is so great that, after a careful study of the situation, the Commission presented to the Governor and the members of the Legislature on November 29, 1919, the salient facts of the situation, and the measures suggested for relief, in order that time might be found between then and the rush of the session to give this subject the thoughtful consideration which it deserves. These measures, which constitute a unified plan to meet the paramount necessity for a proper protection and development of the forest lands of the State, have already in their fundamental features been thoroughly developed and tested by the work of the Conservation Commission in the two greatest forest regions of the State. They accordingly involve an extension to the State at large of the system of forest protection and development now practiced in the Adirondacks and Catskills, with trained foresters in each section, and a further intensification of forestry methods in every section, including the Adirondacks and Catskills.

New York State has in theory long been definitely committed to all of the broad fundamental principles of state-wide forestry, which are here advocated, and in the Adirondack and Catskill regions it has developed the actual practice of these principles to a high degree of efficiency. In other parts of the State, some of them have been put into effect, but only to a slight degree, and in a way that entirely fails to meet the necessities of the situation. The program now advanced provides for undertaking this important work on a broad and effective basis.

Area of Forest Land. With a proper administration of the land best adapted for timber production, New York State should eventually be able to supply a large part, if not all, of its timber needs. According to the best information available, the present forest area of the State, shown on the map which accompanies this report, is as follows:

Forest Areas of New York State

	Acres
Adirondack forest region	4,600,000
Catskill forest region	1,200,000
Other forest regions	2,100,000
Farm woodlots	4,100,000
Total	12,000,000

This is approximately 40 per cent of the entire area of the State. In addition there are approximately 2,800,000 acres of unimproved land scattered throughout the farming sections of the State, which are well adapted to and should be used for forestry purposes. This makes a total of 14,800,000 acres of land in New York State that should be continually managed in accordance with correct forestry principles. The area of improved farms is approximately 14,800,000 acres. *Half of the land area of the State is thus forest land. The Commission*

FOUR MILLION ACRES OF FARM WOODLOTS CAN BE MADE MORE PRODUCTIVE WITH STATE AID.

believes that this forest land should be given the same careful cultivation for the production of a forest crop that the farm land receives. We cannot get along without farms, but it is none the less true that we cannot continue to prosper or even to live without forests. A very important part of this forest land is scattered throughout the farming regions, and the farmer should be encouraged and instructed to so handle this land that it may give him an increasingly valuable crop in the future.

A permanent supply of standing timber, as a raw material for our industries, is a problem of conservation of present resources and of the right administration of approximately one-half of the land area of the State. It is a problem of practical economic importance, which the State can under no circumstances afford to overlook. We cannot stop the cutting of timber, because of the need of material, but we must take steps to insure better utilization of what we have, and a future replacement.

Specific Administrative Program

Forestry Districts. One-half of the land area of the State is in improved farms and one-half in forest and woodlot land; the improved farm area is everywhere intermixed with larger or smaller tracts of forest and woodlot land. For the purpose of developing correct agricultural practices upon improved farm land, a carefully organized system has been developed, known as the farm bureau system, with a farm bureau agent in each one of 55 counties of the State. The Commission now proposes the division of the State into ten forestry districts, with a district forester in charge of each, to handle forestry matters, and to do work in forestry analogous to that of the farm bureau agent in agriculture. While the forest land is equal in area to the improved agricultural land, it will nevertheless be possible, because of the nature of forestry, to handle the work with a far less number of men than have been found necessary for agricultural development. The districts proposed, which are shown on a map accompanying this report, are approximately as follows:

District 1.— Long Island.

District 2.— The Hudson Highlands and the Southern Catskills, embracing Rockland, Westchester, Putnam, Orange, and parts of Ulster and Sullivan counties.

District 3.— The Berkshire area, including Dutchess, Columbia, Rensselaer and Washington counties.

District 4.— The central forest area, including Delaware and parts of Sullivan, Ulster, Greene, Albany, Schenectady, Schoharie, and Otsego counties.

District 5.— The northern spur of the Appalachians, occupying the central portion of the State, including Chemung, Tioga, Broome, Chenango, Madison, Onondaga, Cortland, Tompkins, Cayuga, Schuyler, Seneca, Yates, Ontario and Wayne counties.

District 6.— The Allegany Highlands and the region to the north, embracing Steuben, Allegany, Cattaraugus, Chautauqua, Erie, Wyoming, Livingston, Monroe, Genesee, Orleans and Niagara counties.

District 7.— The southwestern slope of the Adirondacks and adjacent lands, included in the counties of Oneida, Oswego, Lewis and Jefferson.

District 8.— A portion of the central Adirondack section, together with lands in the Mohawk valley, situated in Herkimer, Hamilton, Fulton and Montgomery counties.

District 9.— The northern forest section, included in St. Lawrence, Franklin and Clinton counties.

District 10.— The Champlain area, included in Essex, Warren and Saratoga counties.

Each of these areas should be placed under the supervision of an experienced forester, acting under the direction of the Division of Lands and Forests of the Conservation Commission in the same way that district forest rangers in the Forest Preserve counties now administer their forest areas. With this organization, the administrative work to be accomplished includes forest protection, forest surveying, reforesting and steps to insure scientific cutting and marketing.

Forest Protection. This is fundamental in all forest work, and is absolutely indispensable if investments in forest property are to be safeguarded. Outside of the ninety-seven towns included in the Adirondack and Catskill forest regions, forest fire protection in this State is by law made a duty of the town supervisor. The Commission regrets to say that too often these supervisors are busy with other affairs, or are not interested in this work. Moreover, they are not properly trained in the technical business of forest fire prevention and fire fighting. The result is an enormous loss of forest resources each year from preventable fires.

THIS LAND CLEARED FORTY YEARS AGO NOW GROWS A FOREST CROP.

Other forest areas of the State, outside of the Adirondacks and Catskills, are equally in need of proper protection, adapted to fit the local conditions. The entire remaining area of the State should be thoroughly organized, the people awakened to a sense of the forest fire danger, and steps taken to prevent the tremendous losses that occur each year. Experience in the Adirondack and Catskill sections has demonstrated that this protection can be secured by the proper organization of a fire fighting machine. The forester in each of the districts of the State would effect such an organization.

In 1916 the Legislature passed an act authorizing the Conservation Commission to organize a system of fire protection in forested regions outside of the Adirondacks and Catskills, where forest land exists in blocks of at least 75,000 acres. In accordance with this law, two fire observation towers have been erected on Long Island, and a complete system has been developed there for detecting and fighting fires in that important forested section. Provision should now be made for similarly protecting all forest areas in the State. It is illogical to protect some sections while others are subject to uncontrolled losses.

The protection of forested areas from the ravages of disease and insects should be an important function of the forester. For the last three years the Conservation Commission has been engaged in the detection and eradication of white pine blister rust in the State at large, as well as in the Forest Preserve counties, and has carried on a systematic study for the permanent control of this disease, in cooperation with the United States Department of Agriculture. As a result of eradication work and studies, it has been decided that white pine, which is the most potentially valuable timber crop of the entire State, can be successfully grown in the future if proper administrative steps are taken to protect it from the blister rust. The division of the State into ten districts, with a forester in each, will provide the machinery for making this protection effective. The forester will also be able to give much advice and assistance to private land owners regarding the protection of their forest crops from other diseases and from insect attacks.

Forest Survey. The timber needs of the war strongly emphasized our great lack of information regarding forestry resources, and indicated clearly the need for a careful survey of such resources, as one of the first steps in a comprehensive plan for forest development.

An inventory of forestry resources should be made in order that adequate information may be available for working out the details of a proper plan of management of forest lands. This inventory would be of immeasurable value in bringing about a realization by the people that we have but a comparatively small remnant of our original forest resources left, and would furnish a basis for adequate steps to insure our future timber supply. The people of the State should have this accurate information, and should realize the truth of the matter.

Besides the inventory of standing timber resources, a comprehensive soil survey of the State should be made, for the purpose of determining the lands fit for agriculture, and those that should be used for permanent forestry purposes. On the basis of this soil survey, plans should then be made for forest development of all the lands that should properly be placed under forest growth. Such a soil survey of the State lands of the Forest Preserve has long been a part of the Commission's work of reforesting State lands. The work of forest development on State owned lands, however, is but a part of that which should be done, and this plan accordingly contemplates the extension of soil surveys to the entire State, in order that the most effective use may be made upon private lands of the trees obtained from the State nurseries.

Reforesting. There are two types of forest land in this State: One has some sort of forest cover, and the other has practically none. Reforesting of the non-forested area is vital to the welfare of the State. The forest is a crop. This is a truth which we have failed to realize while we have exploited with a lavish hand the free gift of nature accumulated through the vast, unmeasured past. Already the Commission is operating six State nurseries, from which each year between eight and ten million trees are distributed for reforestation of denuded land. At the present time between four and five million of these trees are being planted upon State owned land of the Forest Preserve, while the remaining four to five million are distributed free of charge to State institutions and at cost of production to private land owners throughout the State. The plan for forest development here presented accordingly contemplates a further development of this system, with enlargement of the State nurseries, and with increased attention on the part of the foresters to the planting of the trees. This work of wide-spread reforestation would be directed to several ends.

The forester would give intelligent advice to the numerous private land owners who have already expressed active interest in reforesting, and he would carry on an active campaign to induce others to take proper steps to put their land under production. In this he would be doing forest development work, entirely comparable to the agricultural development work of the Farm Bureau agents. The result would be the placing of numerous areas of privately owned land in this State under forest production, with profit to the owners and great benefit to the industrial future of the State.

The development of community forests in New York State is already under way, and much interest has been shown in the planting of forests on lands owned by municipalities, townships, counties and school districts. For example, lands which the counties have acquired through the non-payment of taxes, lands which are owned or have been given to cities or villages, lands owned by municipalities, such as waterworks, and State land acquired through non-payment of taxes and foreclosure of loan commission mortgages, can very readily be made productive by forest planting. In many isolated cases, such lands have already been reforested with trees from the State nurseries, and it should now be one of the important activities of the district forester to make this practice wide-spread and effective on a broad State basis.

Highway planting is important, and has for years been recommended by the State Department of Highways. Appropriate trees should be planted along State roads, not only for the purpose of increasing their scenic beauty, but also for conserving a proper amount of moisture by shading the roads, thus preventing the deterioration of the highways. The forester in each district could prepare the necessary plans, supervise the work of planting the trees, and see that after planting they are properly protected, this work, of course, being done in cooperation with the State Department of Highways.

Increased interest is being taken in the care of existing shade trees, and in the increase of shade trees for the future. The district foresters could give a certain amount of advice to the communities in regard to this matter, and assist in the organization of shade tree associations, thus adding materially to the welfare of the State.

Scientific Cutting. The average owner of timber land, and particularly the owner of the farm woodlot, does not fully understand the proper method of cutting, thinning or selection of trees to be taken or left upon the land, in order that the greatest net return may be had from the land throughout successive years and generations. It is accordingly of the utmost importance that there be established a proper silvicultural treatment of woodlands. The private owners should be shown how to differentiate between useful and weed species, thereby bringing their lands to a far higher state of productivity of useful kinds of wood. The farm woodlot can be greatly improved by proper cutting, while at the same time a profit is realized. Moreover, scientific handling of the woodlot will result in a natural reproduction which will insure the continuance of this important farm crop instead of its rapid disappearance. As much of this work can be done in the late fall and winter, it furnishes an opportunity for the employment of much labor otherwise idle. The practice of silviculture is one of the vital principles in wood production, and nowhere is it more important than on the farm. It can be most economically put into effect by demonstration, and would accordingly form one of the important phases of the work of the district forester.

Marketing. The marketing of various forest products is at present not working to the advantage of the people of the State. Logs are sawed at mills without a full conception of the needs of the market, and the products of valuable forest trees are thereby materially reduced in value. The collection of information throughout the State as to the demands of the market and the distribution of this information among the producers of timber would jointly benefit the producer of the timber, the manufacturer, and the ultimate consumer. Under an act of the Legislature, the Conservation Commission has for many years been collecting statistics of forest products for the purpose of determining the annual production, and it is here contemplated that this work should be amplified so that it may be made of concrete benefit to the people, instead of the means for the collection of abstract statistical data. Requests for information regarding the needs of the market and the location of available supplies, which we are at present unable to answer properly, are being constantly received by the Commission.

Forest Recreation. Within the last few years it has come to be realized more clearly than ever before that one of the most important uses of great forest areas is their recreational use. In fact, so important has this use become in the Forest Preserve counties that the business of caring for vacationists far exceeds even the lumber business itself, in the capital invested in it, in the wages paid, and in the annual turnover. Demands for maps and guide books have been insistent, and never before have the people manifested such a deep interest in the recreational facilities of the forests. Each year large numbers of permits are issued for camps upon State land, while the number who camp for short periods without permits is far greater. This interest in healthful out-of-door recreation has become a national characteristic, and is being met by the Federal government in all of the great national parks by the creation of a special department for attention to the needs of vacationists. The administration of the State-owned Forest Preserve for vacationists is now an important function of the Conservation Commission. In addition, the Commission has jurisdiction over the Cuba Reservation in Allegany county, which, by the leasing of its cottage sites, pays an annual net revenue. While the district foresters in the Forest Preserve counties would necessarily give more attention to the recreational development of their territories than the foresters in other counties where State land is not located, it is nevertheless true that the foresters in every district could do much to stimulate proper development of forest recreation throughout the State, and distribute information regarding the recreational advantages of the Forest Preserve.

General Recommendations

Free Trees for Reforestation. In addition to the administrative measures outlined above, the Commission believes that the State should supply trees for reforestation free of charge to private land owners, under agreements with the land owners that the trees will be properly planted and cared for. While it is of course true that the private land owners who use the trees would receive a direct financial benefit from these trees, through the increased sale value of their idle land after a very few years, and also from the eventual production of a forest crop, the Commission nevertheless feels that the urgent need for stimulating reforestation will well justify the expense to the State. For every dollar spent in the distribution of free trees to the farmers and other owners of idle, non-agricultural land, the industries of the State and the people at large will realize a direct return multiplied many times.

NEW YORK STATE WASTE LAND WILL PRODUCE A CROP FULLY EQUAL TO THIS EUROPEAN PLANTED FOREST.

Trees from the State nurseries are distributed free of cost in the State of Pennsylvania, and in the year 1917, 1,749,397 trees were supplied to private land owners. The system has worked excellently, and Pennsylvania has demonstrated that reforestation of idle land is materially stimulated by the free distribution. New

York has long recognized the importance of stimulating reforestation of private land by selling trees from the State nurseries at cost. The raising of these trees costs the State so little that in 1919, when 2,265,055 trees were sold, the total receipts were only $5,507.60. If the planting of trees should be increased many times, because of free distribution, the resulting expense to the State would nevertheless not be unduly large, while the resulting benefits would be out of all proportion to the cost.

Constructive Forest Taxation. Forest taxation laws should be revised so that the private land owner may be encouraged to permit his forest crop to grow to maturity. Under the present system, the land owner cuts his trees at the time when they are growing most rapidly, because the high tax recurring each year, and uncertainty as to future taxation, discourage any other method. This system is wasteful, because when a tree has reached a size where it first begins to have cutting value, it grows most rapidly, and should be permitted to stand until its period of maximum growth has passed. In other words, we should provide by rational taxation for the harvesting of the mature crop, and not for the cutting of our trees before they are half grown.

Three laws were enacted in 1912, which aimed toward the alleviation of taxation on reforested lands and woodlands managed according to certain forestry methods. These laws are as follows:

"Taxation of Reforested Lands." Sec. 16 of the Tax Law, as added by Chapter 249, Laws of 1912.

"Taxation of Woodlots." Sec. 17 of the Tax Law, as added by Chapter 363, Laws of 1912.

"Exemption of Reforested Lands from Taxation." Section 57 of the Conservation Law, as added by Chapter 451, Laws of 1916. (This law was first enacted in 1912 as Section 89 of the Conservation Law, Chapter 444.)

The records of this Commission now show that forty-three parcels of land, aggregating 1279.15 acres, have been classified under the provisions of these laws. It is needless to say that the aim of this legislation has not been reached, as is shown by the annual classification under the separate laws as given below:

Land Classified Under Forest Taxation Laws 1912 to 1919

	Sec. 16	Sec. 17	Sec. 18
1912	3	....	....
1913	213.5	107.5	....
1914	50	....	....
1915	96.9	347	10
1916	105	167.5	88
1917	50	4.75	....
1918	..	36	....
1919	..	....	....
Total acres	518.4	662.75	98

The application of these taxation laws has been found very unsatisfactory. Section 16 is the best of the three laws, but is limited to reforested tracts of not more than 100 acres. This provides for complete exemption on lands entirely reforested and a reduction of assessment on lands which are underplanted. The period of exemption or reduction lasts for thirty-five years, and is followed by a cutting tax of five percent of the stumpage value at the time of cutting.

Section 17 applies to woodlots of not more than fifty acres in extent. The object of this law is usually defeated by the local assessors. The law provides for assessment of lands classified under this section at not more than $10 per acre. When lands are classified under this law, the apparent result is that the assessors have raised the assessment on the remaining farm property to offset any reduction made on account of the exemption of the farm woodlot. This cannot happen where the woodlot is a separate tract, but such cases are rare.

Section 57 is so cumbersome and entails so much red tape that only two parcels have been classified under its provisions during the eight years that it has been in force. Persons who have begun proceedings for classification under this section have given it up rather than take the trouble involved to complete it. Both this law and the woodlot law fail to meet the desired object, and it would prove a benefit if they were repealed.

New legislation along the lines of forest taxation is much needed. The difficulty seems to be in drafting a law which will meet all conditions and which is sufficiently simple in application. The Commission believes that the present laws should be repealed, with the possible exception of section 16 of the Tax Law, but without prejudicing the rights of any land owner who has had his land classified thereunder, and that a more effective law be worked out in conference with timber land owners and other careful students of this subject.

Benefits of State-wide Forestry

A full summary of the benefits that will accrue to New York State upon the adoption of a broad plan for forest development will reach into practically every phase of the life of the people. Hardly an industry can be named, which is not in one way or another dependent upon supplies of wood. With the development of our water resources, the need for wood supplies will be even greater. A decrease in the production of wood products and a relocation of mills elsewhere will all tend to increase the cost of products to the consumer. We must accordingly maintain and develop our forests, and thus protect our industries, and employ our labor. We must insure permanency in industry, and not allow parts of the Empire State to become deserted villages. This is a social and economic problem, which a broad plan of forest development can do much to solve.

If our forest soils are properly handled, we will be able not only to maintain the industries which we have, which are now such a very important asset to the State, but also, by increased production of forest products, to provide for the establishment of other and necessary industries. Thus, the need for greater production, which economists have recognized as one of the necessities in the solution of our present economic and social problems, can be at least partly accomplished through better forestry.

We are on the threshold of a great development of water power resources, and this points to the need for better forest cover as a protection of the watersheds, and as a preventive of destructive floods.

New York State cannot lag behind in this important matter. Forest development is a vital need of to-day, and it must be met. The next session of Congress will see bills introduced to stimulate this work throughout the entire country, and to cooperate with those states that take constructive action. By the initiation of the work here outlined, New York will benefit by Federal cooperation under laws already passed, and others that will be passed, and will place herself in the vanguard of those commonwealths that realize the exhaustibility of forest resources and the necessity for conservation and replacement.

FOREST PRODUCTS IN 1918

In accordance with Section 58 of the Conservation Law, statistics of the amount of lumber manufactured and round wood consumed from the forests in the State during the calendar year of 1918 have been collected and tabulated as follows:

Lumber	Feet B. M.
Spruce	25,874,690
Hemlock	75,005,150
Pine	62,653,500
Balsam	1,505,094
Cedar	227,568
Tamarack	91,114
Maple	55,789,225
Beech	37,196,320
Oak	26,895,820
Birch	25,505,900
Chestnut	15,370,950
Basswood	14,533,350
Ash	9,696,750
Elm	7,314,180
Locust	2,085,690
Poplar	1,167,300
Hickory	898,270
Cherry	763,885
Gum	223,165
Sycamore	160,900
Minor species	74,075
	363,132,896

Round Wood	Cords
Spruce pulpwood	335,423
Balsam pulpwood	54,460
Hemlock pulpwood	85,054
Poplar pulpwood	22,925
Basswood pulpwood	3,780
	501,642
Wood for acid, excelsior, kilns, etc	225,420
Total cords	727,062
	Feet B. M.
Equivalent B. M. of cordwood	399,157,038
Lumber	363,132,896
Total of lumber and round wood	762,289,934

Pieces

Shingles	5,712,000
Lath	4,179,300
Heading	8,296,366
Staves	453,000
Posts	91,462
Poles	19,218

Forest Products by Years

Year	Ft. B. M.
1908	1,226,754,365
1909	1,091,164,710
1910	927,933,291
1911	972,596,685
1912	942,545,269
1913	851,391,367
1914	855,658,389
1915	804,142,388
1916	863,932,860
1917	861,870,781
1918	762,289,934

LANDS ACQUIRED
From Jan. 1, 1919 to Dec. 31, 1919
Adirondack Preserve
ESSEX COUNTY

Hoffman Township	Acres
Lot No. 53, N. W. ¼	62.50
Lot No. 54, Ex. N. E. ¼	187.50
Lot No. 54, N. E. ¼	62.50
Lot No. 55, S. end of S. E. ¼	30.00
Jay Tract	
Lot No. 125, Ex. 20 acres, south end	306.00
Old Military Tract	
Township No. 1	
Thorn's Survey	
Lot No. 91	160.00
Lot No. 101	160.00
Townships Nos. 1 *and* 2	
Richards' Survey	
Lot No. 38, part	545.77
Lot No. 90, W. part	468.30
Lot No. 90, sub. 14	50.00
Township No. 11	
Lot No. 112	160.00
Lot No. 114, S. W. ¼, Ex. 15 acres, N. end	25.00
Lot No. 114, S. E. ¼, Ex. 15 acres, N. end	25.00
Lot No. 115, N. W. ¼	40.00
Lot No. 153	160.00
Lot No. 172	160.00
Lot No. 173	160.00
Lot No. 191	160.00
Lot No. 192	160.00
Lot No. 194	160.00
Lot No. 212	160.00
Lot No. 325, N. E. ¼	40.00

Roaring Brook Tract	Acres
Lot No. 68, part	400.00

FULTON COUNTY

Glen, Bleecker and Lansing Patent

Lot No. 51, sub. 4	127.50
Lot No. 51, sub. 6	127.50
Lot No. 52, sub. 5	101.34
Lot No. 52, Ex. subs. 2, 3, 5 and 6	628.40
Lot No. 61, part	787.15

HAMILTON COUNTY

Arthurboro Patent, South Half

Morehouse 8,000 Acre Tract

Lot No. 21	200.00
Lot No. 35, W. ½ of S. ½	50.00
Lot No. 36, Ex. reservoir	187.00
Lot No. 37, Ex. reservoir	174.00
Lot No. 38, Ex. reservoir	136.00

Benson Township

Lot No. 108	160.00
Lot No. 115	160.00
Lot. No. 366, Westerly side	50.00
Lot No. 381	160.00

Bergen's Purchase

Patents 8 and 9

Lot No. 4, part	125.38
Lot No. 5, part	39.00

Oxbow Tract

Lot No. 32, All in Town of Lake Pleasant	65.00
Lot No. 52, All in Town of Lake Pleasant	65.00

Totten and Crossfield Purchase

Townships Nos. 10 and 29

Lot No. 2, part	144.38

HERKIMER COUNTY

Adgate's Eastern Tract

Minuse (J. H.) Tract	Acres
Lot No. 2	100.00
Lot No. 3	100.00
Lot No. 4	100.00

Moose River Tract

Township No. 1

Parcel in Northwesterly part	14,824.57

Totten and Crossfield Purchase

Township No. 41

N. W. Corner	2,088.00

LEWIS COUNTY

Brown's (John) Tract

Township No. 1

North end, parcel in	4,298.48

ST. LAWRENCE COUNTY

Macomb's Purchase, Great Tract No. 2

Township No. 11

Lot No. 1, Ex. N. E. Corner	433.83
Lot No. 2	598.61
Lot No. 3, Ex. Clear Pond Res. in E. end	576.75
Lot No. 4 Ex. Clear Pond Res. in W. end	376.40

Township No. 13

Lot No. 37, N. E. part (2 parcels)	46.27
Lot No. 38, S. E. Corner	2.30
Lot No. 45, N. and E. sides (2 parcels)	187.97
Lot No. 46, S. E. part	108.39
Lot No. 47, S. E. Corner	18.65

Township No. 14	Acres
Lot No. 15, S. and W. sides	207.55
Lot No. 16, S. end	130.38
Lot No. 17	344.47
Lot No. 18	616.36
Lot No. 35, S. W. part	360.60

Great Tract No. 3

Township No. 15

N. E. ¼, Southerly part	4,411.00
S. ½, E. end	8,266.00

WARREN COUNTY

Palmer's Purchase

General Allotment

Lot No. 13, All in Warren County	555.95
Lot No. 18, All in Warren County	810.50
Lot No. 22, part	210.00
Lot No. 23, part	203.00
Total, Adirondacks	47,000.25

Catskill Preserve

GREENE COUNTY

Hardenburgh Patent

Great Lot No. 21

Parcel E. side (Kipp)	178.40

Great Lot No. 25

Lot No. 83	117.00
Lot No. 87, N. W. part	74.00
Buddington Tract (unallotted)	685.04
Showers Gore	182.40

State Land Tract	Acres
Lot No. 53, Easterly part	157.00
Lot No. 53, Northerly part	202.00
Lot No. 68	212.00
Lot No. 69	212.00
Lot No. 79, part	47.80

ULSTER COUNTY

Hardenburgh Patent

Great Lot No. 6

Denning Tract

Lot No. 7, part	73.75
Lot No. 8, part	107.00
Lot No. 9, part	37.50

Great Lot No. 25

Lot No. 87, S. E. part	50.00
Total, Catskills	2,335.89

DIVISION OF WATERS

DIVISION OF WATERS

Albert H. Perkins	*Division Engineer*
Alexander Rice McKim	*Inspector of Docks and Dams*
Edward H. Sargent	*Senior Assistant Engineer, Water Power, Storage and Drainage*
Russell Suter	*Senior Assistant Engineer, Water Supply and Sewerage*
Frank H. Macy	*Assistant Engineer*
Edwin S. Cullings	*Assistant Engineer*
Frank D. Porter	*Assistant Engineer*

DIVISION OF WATERS

WATER POWER POLICY

In its last Report to the Legislature, the Commission outlined what it believes to be a proper basic water power policy for the State, and then proceeded to summarize the most important steps necessary to make this power policy effective. In that report it was pointed out that the most pressing need for all of the water power available arose in the course of the war, and had found New York State unprepared. Since then, the country has been faced by a coal strike, which threatened to bring about a fuel shortage quite as serious as that experienced during the war. In fact, fuel regulations, almost as stringent as any of the war time restrictions, were for a short time in operation, and were lifted only because the strike was settled.

This is the second time within two years that New York State's neglect of its water powers has plunged the State into real distress. It requires no effort of logic to see that this emphasizes the urgent necessity for a vigorous, constructive State policy regarding proper development of latent water power to meet the State's growing needs and to protect it against such crises as that precipitated by the recent strike.

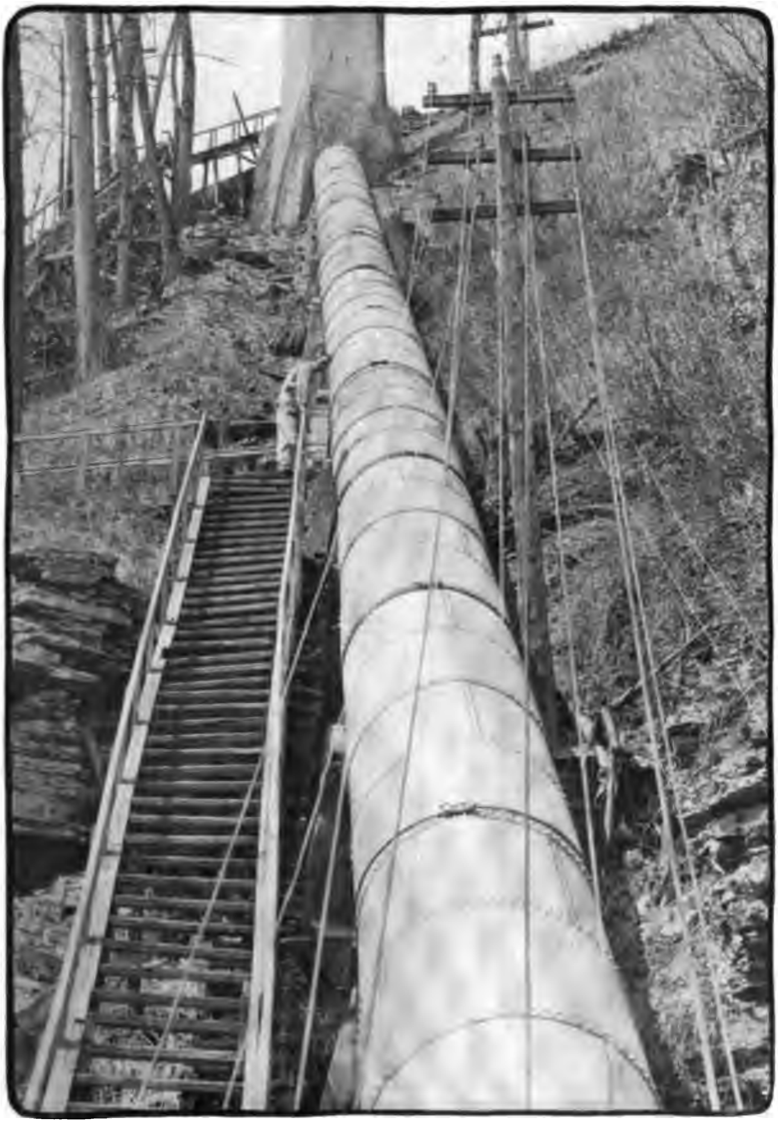
The importance of power development to the people of the State can be more readily appreciated upon consideration of the amount of white coal available year after year in the State.

New York State has done more in the survey and study of power systems than any other state, and is now in a position immediately to take the lead in the actual development of power. These studies and surveys, which have been made by the Conservation Commission and its predecessors during the last twelve years, show that the streams of the State, including New York's share of the boundary streams, could be made to develop more than 1,960,000 horsepower of electric energy, in addition to the 980,000 horsepower which they are now furnishing by power developments already installed. It would require more than 15,000,000 tons of coal a year to produce the 1,960,000 horsepower of electric energy now undeveloped in the State's streams.

Should it ever become necessary to develop every footpound of energy available in the streams of the State and to sacrifice the beauty of Niagara Falls, which is now protected by a treaty with Great Britain, it would be possible, by using the complete flow of the Niagara river, to develop altogether 4,080,000 horsepower beyond what it can still be made to furnish under the treaty agreement. Assuming that New York would be entitled to one-half this power, or 2,040,000 horsepower, it will be seen that, added to the 1,960,000 horsepower already referred to as still available in this and other streams of the State, we have a total of 4,000,000 horsepower of developable water power still available in New York State. This is an amount sufficient to replace more than double the coal now used for all purposes, other than transportation and heat.

The reason that heat must be excluded from the advantages derivable from electricity is that the amount of electrical energy required to create a given temperature under given conditions is so great, as compared with the amount of coal which will produce the same temperature, under the same conditions, as to preclude the present day use of electricity for heating on a broad scale. Roughly speaking, it would require twenty tons of coal, converted into electricity, to create the amount of heat that can be generated directly by one ton of coal. In other words, the ratio of efficiency between coal and electricity for heating purposes is twenty to one in favor of coal.

Admitting that the development of the State's latent waterpower would not replace the use of all coal, the tremendous saving that could be effected is self-evident. Apart from the danger of coal strikes, it is well known that the country's supply of coal is not inexhaustible. Statistics of the United States census show that the total primary horsepower installed in New York State was, in 1869, 334,368; in 1914, 2,356,655. The present rate of growth would indicate approximately 3,000,000 in 1919. If New York State is to continue to progress industrially on anything like the same scale as these figures show that she has been progressing for the last fifty years, it will be the part of wisdom for her to take, without further delay, such steps as are necessary for the rapid development and use of the electrical energy that is at hand in her streams.



HORSE POWER CONFINED WITH DIFFICULTY IN A STEEL TRUNK MAY EASILY BE LED LONG MILES UPON SLENDER STRANDS OF WIRE.

After another year of careful study and consideration of a proper State water power policy, the Commission has seen no reason to change the recommendations that it made to the Legislature a year ago. Various points of this policy are so fundamentally important that it accordingly seems wise to present them again at this time without change, but with elucidation of one or two details, which the discussion of a year ago indicated were not clearly understood.

Regulation of Stream Flow. The first physical essential in the development of latent water power, both State and privately owned, is regulation of the stream flow, in order that the enormous quantities of flood water, that are now wasted, may be held back in suitable storage basins for release during the periods of drought. Such a regulation of stream flow is but a logical continuation of the State's policy of protecting its watersheds, which has for many years been so successfuly carried out in the Forest Preserve areas.

Conservation of ground water in the forest, however, can never more than partially regulate stream flow, and is accordingly but one part of the great task with which we are confronted. As the Commission has heretofore pointed out, "Water is conserved in the forests that it may reach the streams, and to release control of it there is to leave it when it has entered upon its stage of greatest usefulness. Throughout the entire water course the interest of the public is paramount. Power is developed for public use, and water is diverted to the canal systems of the State for public transportation purposes. In the face of this public interest, it is imperative that regulation of the streams be given the same careful attention by the State that conservation of water in the forest receives. This is particularly important on those streams whose watersheds are not heavily wooded and which are immediately affected by rainfall and dry weather."

The power value of any river depends largely upon the uniformity of its flow. In the minds of most laymen, any waterfall is a potential economic water power development. Nevertheless, this is not always true. The capital cost of a *hydro*-electric plant is much greater than that of a *coal*-electric plant of the same capacity; the maintenance cost, however, of the *hydro*-

electric plant is much less. But if the flow of water to the *hydro*-electric plant is so fluctuating as to require the installation of a steam auxiliary of nearly as great capacity as that of the hydro-electric plant, the benefit from the water power plant is largely lost.

New York State is very fortunate because the topography of its watersheds is such that there are many natural reservoir basins which can be dammed and in which the spring floods can be stored, to be held and released in time of low flow, thus maintaining a greater uniformity in the stream.

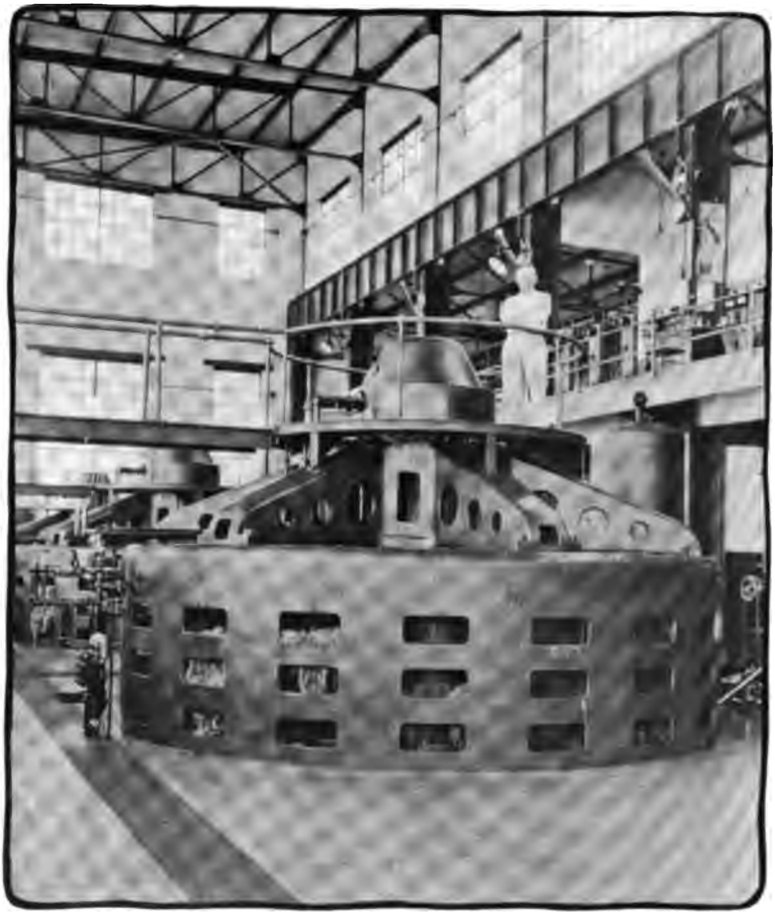
The Conservation Commission believes that the storage of water on a sufficiently broad basis to accomplish the purpose of adequate stream regulation must be on so large a scale and is so intimately bound up with many problems of public policy and interest that it can be properly undertaken only by the State itself. In so far as State lands are involved, this has become the fixed policy of the State by virtue of an amendment to the Constitution, known as the Burd Amendment, adopted November 4, 1913, which provides that storage reservoirs upon State land " shall be constructed, owned and controlled by the State. * * * Any such reservoirs shall always be operated by the State."

Assessment of Costs of Storage Reservoirs. The principle that the cost of construction of storage reservoirs for stream regulation should be assessed upon those benefited, in proportion to the extent of their benefits, is already established in the Constitution by the Burd Amendment, provided State land is flooded, and is not open to further change unless the Constitution itself is amended in this respect.

Article 7, Section 7, states that " the expense of any such improvements shall be apportioned on the public and private property and municipalities benefited to the extent of the benefits received."

It is apparent that this sentence makes no provision for any payment to the State on account of construction, beyond that actually incurred by the State in the course of the construction. It is equally clear that where State property is benefited by such improvements, the State itself must pay a proportion of the construction cost, determined by the extent of the benefit to

State-owned property. The Conservation Commission is in thorough accord with this principle, and believes that it should apply to all storage projects for control of stream flow by State agency.



IN THE POWER HOUSE BRAWLING TORRENTS ARE SILENCED AND HARNESSED FOR THE SERVICE OF THE STATE.

Assessment of benefits. In the regulation of stream flow, the State will render certain definite and valuable services to both public and private property and municipalities situated below the regulating dams. On many of the water courses, the storage reservoirs will flood land already owned by the State. Moreover, it is probable that in the working out of water storage it will become necessary for the State to acquire all the lands flooded before the reservoirs are constructed, so that in the last analysis all of the land within the area of the reservoir will be State owned land, whether it is already part of the Forest Preserve or not. Part of the benefits derived from stream regulation will thus depend upon the use of State property for reservoir purposes. The State will render other services which are immediately apparent upon consideration of the various legal, financial and administrative steps that must be taken in bringing about stream regulation. After the work is completed, there will be expenses of maintenance and operation from year to year. The Constitution requires the State to construct the reservoirs and to maintain and operate them, when Forest Preserve land is used, and it is logical that the Constitution should further require the beneficiaries to pay a reasonable return to the State for the benefits derived from the construction and operation of the public works involved. This provision is stated in that part of Article 7, Section 7, which says that "the Legislature shall provide for a charge upon the property and municipalities benefited for a reasonable return to the State upon the value of the rights and property of the State used and the services of the State rendered, which shall be fixed for terms of not to exceed ten years and be readjustable at the end of any term."

The Conservation Commission believes that the Legislature should provide, with a considerable degree of definiteness, for the assessment of charges upon those benefited. In every work of this sort, it is necessary to know in advance, within reasonable limits, not only the first cost of the work, but also the annual carrying charges. The Commission believes that it will be very difficult to induce private capital to interest itself in development work of this kind, unless it understands in the beginning the conditions which it must face. In fact, it is probable that one of the important factors which has operated to retard the development of water power in New York State in the past has been the lack of certainty regarding the State's policy. This has resulted in a reluctance on the part of those who would develop water power properties to invest their capital, without being able to learn in advance the attitude of the State toward assessments for water storage benefits. Money invested in water power development is permanently invested, and the business can never be discontinued without the almost total sacrifice of the original outlay.

Charges of this sort must, by their very nature, be determined in every case upon the basis of the special factors governing each situation—such factors as the amount of power actually developed at a site, the conditions under which it is developed, the amount of undeveloped power, nearness to market, and other economic and engineering considerations which govern the value of a particular site. Nevertheless, in spite of a great difference in power values, on account of these variable factors, it should be possible to establish definite methods of assessing all benefits, of whatever character, so that the beneficiaries may know with reasonable assurance the limits within which charges will fall. The Conservation Commission believes that these charges should be at least large enough to fully reimburse the State for all expenses of maintenance and operation, and to pay a fair annual rental on the State land flooded.

Power Dams at State Owned Sites. The Conservation Commission recommends that the State itself construct power dams upon the power sites owned by the State.

Power dams upon State owned sites should, of course, be constructed only as rapidly as it appears possible to find a market for the power to be generated at those points. In other words, the Commission does not believe that the State should enter upon the extensive construction of power dams wherever opportunities exist, but rather that the policy should be definitely established that, as rapidly as it is possible to absorb the power from them, the State will build these dams as permanent improvements.

In many cases, the State has only a partial interest in the power site, as by owning one side of the stream, or a portion of the available falls, while the balance of the interest is privately owned. In such cases the Commission believes that the privately owned interest should be acquired by the State. It would be manifestly inadvisable for the State to enter into a partnership arrangement for the development of an individual power site. It is equally clear that the State should never part with the fee that it now holds in such sites. The only proper solution appears to be for the State to acquire outstanding interests in these properties. The State can then construct power dams upon such sites without any of the complications involved in dual ownership.

State Owned Power Sites Should be Leased. The Conservation Commission believes that, having accomplished the regulation of stream flow, and having constructed the permanent improvements necessary upon the State owned power sites, by the building of power dams, the activity of the State in hydro-electric development should cease, and that succeeding steps, the generation and transmission of power and its delivery to the consumer, should be undertaken by private or municipal enterprise by lease of power privileges from the State on proper terms.

The Conservation Commission believes that these State owned powers should be leased only after competitive bidding, and that the State should derive all of the revenue possible from them. If they are leased at less than their full market value, one locality will obtain advantages in the power which another locality will lose. If they are leased for their full market value, however, all of the people of the State will obtain benefit from them, through payments made to the State Treasurer.

The Commission does not believe that we have yet reached the point, if, indeed, it will ever be reached, where the theory of State ownership can be successfully worked out in this field. If it should be adopted at this time, it would become necessary for the State either to undertake the development, distribution and sale of electric energy, in competition with the private enterprise that is now engaged in this work, or else to purchase or appropriate the properties of all the companies that are now established in this business. Either course would involve the State not only in an enormous expenditure, but also in a stupendous experiment, the end of which no one can foresee. It would plunge the State into a maze of political, social, economic and financial problems of a magnitude and intricacy that may well make us pause.

In the opinion of the Commission, the only exceptions to the general proposition that the State itself should not go into the actual generation of power are found on the St. Lawrence and

Niagara Rivers. These streams are boundary waters and the power problems that they present are complicated by questions affecting the Dominion of Canada and the federal government. Because of this, it is possible that the most satisfactory development of the water power projects located upon them would include not only the building of the power dams and other necessary stream structures as permanent improvements, but possibly also the construction and equipment of the power plants, to be operated either by lessees or by the State itself. If operated by the State, the Commission believe that the power should be sold at the bus bars.

WATER POWER DEVELOPED AND UTILIZED MEANS REAL CONSERVATION.

Benefits to the Public. In any consideration of this problem, it is advisable to keep clearly in mind the fact that power companies are already established upon many of the largest rivers, with distributing systems reaching to wide markets, but that they nevertheless have insufficient water during the dry periods to properly supply those markets without the aid of steam auxiliary plants. The regulation of the flow of the rivers by storage reservoirs constructed by the State will immediately be felt in more efficient and economical operation of plants already existing. Stream regulation will, in addition, immediately encourage the building of additional hydro-electric plants and transmission lines at many points. The benefits of the efficient administration of these power plants and the increased advantages which they will derive from stream regulation can be realized by the public through regulation of rates and service by the Public Service Commission.

The public will receive, in addition to increased power and lower rates, a substantial revenue from the lease of power privileges at reservoir dams and power sites on State land. That this revenue will be a very material factor in the income of the State is evident when one considers that the amount of undeveloped power in which the State now has some interest is 993,200 horsepower.

The Constitution provides, as above stated, for "a reasonable return to the State upon the value of the rights and property of the State used and the services of the State rendered which shall be fixed for terms of not to exceed ten years and be readjustable at the end of any term."

How much such charges should be looked to for an actual revenue to the State, over and above maintenance and operating expenses, is for the Legislature to determine when it provides, as required by the Constitution, for a return to the State.

The Commission believes that this return should be adequate and substantial, and not less than the cost of maintenance and operation and the fair rental value of State lands used.

One of the greatest needs of the reconstruction period, as it was of the war period, is for power — actual kinetic energy, and not potential, undeveloped power sites. A realization by every interest concerned of all that is implied in these statements should be effective in ending the procrastination, delay and obstruction that have thus far thwarted every attempt to achieve results in power development in New York State.

Summary of Power Policy. All of the points discussed above, which the Conservation Commission believes should characterize the State's permanent, fundamental water power policy, may be briefly summarized as follows:

I. Regulation of stream flow by the State.

II. Assessment of the cost of stream regulation upon public and private property and municipalities benefited in proportion to their benefits.

III. Provision for a reasonable return to the State upon the value of the rights and property of the State used and the services of the State rendered, by charges levied upon the property and municipalities benefited, such charges to be fixed for terms of not to exceed ten years and to be readjustable at the end of any term, this return to equal at least the cost of the services and the fair rental value of State property used.

IV. Construction by the State of power dams upon State owned power sites.

V. Leasing of power privileges at State owned power sites to private power companies or to municipalities, with provision for periodical readjustment of the rental charges, with the posssible exception that upon the St. Lawrence and Niagara Rivers the State should build and equip power plants to be operated either by the State or by lessees.

VI. Generation, transmission and distribution of power to be conducted by municipalities or by private enterprise, subject to regulation by the Public Service Commission.

MAKING THE POWER POLICY EFFECTIVE

Upon proceeding to a consideration of the steps necessary to carry out any water power policy of the State, it becomes apparent immediately that three distinct situations are presented, each one of which involves problems that are peculiar to itself.

First, there are the surplus waters of the Barge Canal, which are a source of a considerable amount of potential water power, but which under the law cannot be leased, sold or used for this purpose until the Legislature has, by general laws, made provision therefor. After such provision has been made, the waters of the Barge Canal can then be used for power purposes only after all of the needs of navigation have been met.

Second, the State has an enormous amount of undeveloped water power in the St. Lawrence and Niagara Rivers, which are boundary streams. The development of this power accordingly introduces questions affecting the interests of the Dominion of Canada and the Federal Government. Inasmuch as the power available in these two places will amount to approximately two-fifths of the total water power of the State, when it is fully developed, and is moreover available in large blocks, it is apparent that the questions presented by the boundary streams are pressing for early solution.

Third, the water storage problems presented on the interior streams of the State offer difficulties which must be met in a different way than those found on the Barge Canal or the boundary waters.

It is unnecessary in this place to attempt to fully discuss all of the legal and other difficulties presented by the three situations outlined above. The Commission desires, however, to point out a number of the more important things that it believes should be done by the Legislature if the decks are to be cleared and the power needs of the State are to be met. These points are contained in the following paragraphs.

Leasing of Barge Canal Powers. A bill was introduced into the Legislature in 1918 to provide for the leasing of the surplus waters of the Barge Canal. As originally introduced, the bill made it possible for municipalities, as well as private corporations, to bid for the surplus waters, but as finally passed, it was amended in such a way as to prevent municipalities bidding for the power. The bill was vetoed by the Governor on this account, with the statement that he was leaving it for another session of the Legislature. Another bill introduced in 1919 failed of passage. The Conservation Commission accordingly respectfully recommends that legislation be enacted for the leasing of the surplus waters of the Barge Canal, without any discrimination against municipalities. This will clear up the entire situation with regard to the surplus waters of the Barge Canal and will meet, in part, the urgent need for power in some of the State's most densely populated industrial centers.

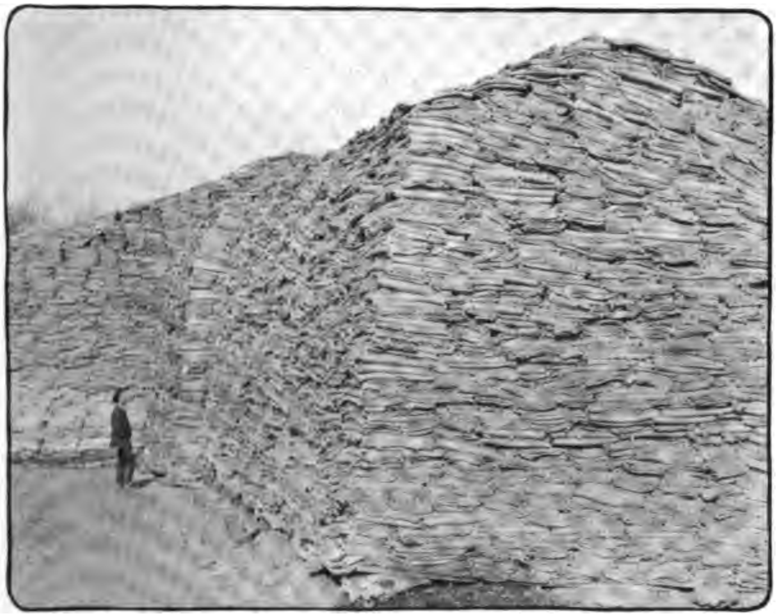
Revision of Water Storage Laws. Two separate laws are now upon the statute books for effecting stream regulation by storage reservoirs. These are Article 7 and Article 7-A of the Conservation Law. While both of these laws embody many excellent features, the Conservation Commission believes that neither of them adequately meets the needs of the situation. In fact, this seems apparent on the face of things, as Article 7 has been on the books since 1911 without any storage project having been put through under it. Article 7-A has been effective since 1915. A petition was presented by the Glens Falls Chamber of Commerce in 1916 praying for the creation of the upper Hudson River Drainage Improvement District, but after a number of hearings it was withdrawn by the petitioners.

A petition under the statute was filed in 1919, praying for the creation of the Black River Regulating District. The action of the Commission in this matter is described in detail elsewhere in this report but it suffices to say here that carrying out the procedure outlined in the statute, the Black River Regulating District was duly incorporated on August 14, 1919.

Article 7 permits the initiative in matters of stream regulation to be taken by the Commission, which, for the purpose of river regulation, consists of the Conservation Commissioner, the State Engineer and Surveyor and the Attorney-General. It also provides for the initiative being taken by the petitioners in the district to be affected. Article 7-A, however, makes no provision for the initiative being taken by the State itself. It is of the utmost importance, the Commission believes, that stream regulation now be taken up by the State in a vigorous, constructive manner, with a definite centralization of responsibility for action.

Article 7-A provides for a dual jurisdiction in matters of stream control. The Commission mentioned above exercises certain functions, while other powers are conferred upon a local river regulating board. It is believed that a much more simple and workable system can be devised, and one which will better protect the interests of the State.

Both Article 7 and Article 7-A provide that the Commission having jurisdiction over storage matters shall consist of the Conservation Commissioner, the State Engineer and Surveyor and the Attorney-General. The creation, in addition, of a local board is not only in the direction of decentralization of authority and responsibility, which is contrary to modern tendencies in State government, but also creates such a multiplicity of directing heads as would very materially increase the difficulty of obtaining the unified control and use of hydro-electric energy that is so important if every part of the State is to receive the full benefits from development and proper distribution of power. Comparatively recent advances in the art of electrical transmission have made interconnection of systems entirely feasible and such interconnection was resorted to at Federal instigation during the war. With this interconnection, power developed at one point where water is available may be transmitted to a distribution system far distant which, for the moment, has insufficient water. The policy adopted in New York State should permit of a centralized control not only of preliminary plans for utilization, but also of the actual utilization and wide distribution of power made available by such storage.



NEGLECTED WATER POWERS MEAN MORE EXPENSIVE WOOD PULP AND INCREASED COST OF PRINTING. THE PRINTING PRESS UNDERLIES ALL MODERN CIVILIZATION.

The Commission believes that to accomplish these purposes a Commission composed as provided in Article 7 and Article 7-A has a great deal of merit. The Conservation Commission has a wide knowledge and experience in matters of rainfall, run-off, stream control and hydro-electric engineering that are absolutely essential. The State Engineer and Surveyor is able to supply an organization of experts in matters of engineering construction that it seems unnecessary to duplicate in any other branch of State work. In the solution of the complicated legal problems that will be presented, the fact that the Attorney-General is a member of the Commission will be of the utmost advantage to the State.

Authority to Lease Power Sites. The Commission is at present without proper authority to lease State owned power privileges, and no adequate provision has yet been made for the building of power dams. The question of the building of power dams and the leasing of power privileges should accordingly have the attention of the Legislature and the Commission should be given adequate authority in the premises.

Power Development and Transmission in the Forest Preserve. The Burd Amendment to Article 7, Section 7, of the Constitution permits the flooding of not more than three percent of Forest Preserve land for purposes of water storage and stream regulation. This amendment, however, only partially meets the power situation, since a large number of the State owned power sites are upon lands of the Forest Preserve, but cannot be developed as power sites under the present restrictions of Article 7, Section 7. It seems clear that in this respect the State is standing in its own light, and should complete what it has already begun in the Burd Amendment, by passing another amendment to permit the erection of power dams and power houses and the development of power on the State owned land and its transmission across State land.

Unused Water Power Charters. The Commission recommends that all water power charters heretofore granted to companies for water power privileges receive the attention of the Legislature, for the general purposes of repealing unused charters and placing proper limitations upon used charters.

Boundary Waters. When every effort of Federal and State governments and of the industrial organizations of the country were directed to winning the war, attention was focused upon the vast opportunities for water power development on the boundary streams of New York State. An application for permit to develop water power on the St. Lawrence was presented to the International Joint Commission during the year 1918 and hearings were held upon this application. The Federal government urged the granting of the application, placing the whole matter on a " win the war " basis. The State of New York was represented at these hearings by the Counsel to the Conservation Commission and the Division Engineer. While it was realized by the Commission that the foremost need of the moment was to win the war, it was nevertheless felt that it would be unwise to permit the rights of the State to be permanently impaired, and representations to this effect were accordingly made at the hearings, as a result of which the International Joint Commission granted the application upon a " win the war " basis and reserved the right to take new steps at the end of the war.

ALBANY HAS LEARNED THAT WITHOUT STREAM CONTROL BY STORAGE RESERVOIRS, DESTRUCTIVE FLOODS ARE OF PERIODIC OCCURRENCE.

Now that the war is ended, the Commission feels that one of the most important measures to be taken up is that of clearing up this entire boundary water question. The situation on the St. Lawrence River is acute. The Canadian authorities, both of the Dominion and the Province of Ontario, are giving the subject of the development of power on the St. Lawrence very great attention and study. The Province of Ontario has a party of engineers devoting its time to the study of the control of the levels of Lake Ontario by means of a dam in the vicinity of Waddington, with the expectation of developing and using the water power at this point and at points further down. The State of New York should cooperate in these studies.

The attitude of the Dominion of Canada, as shown by an Order in Council, is for the Dominion to build these dams for the purpose of canalizing the St. Lawrence River for navigation purposes, leaving to the province within whose jurisdiction the dams are located the right to develop the power.

The Conservation Commission feels that the State of New York should keep pace with every step taken by its neighbors across the river to utilize the immense power of the St. Lawrence, and should cooperate with the Dominion of Canada and the Province of Ontario to the utmost in surveys, studies, plans and actual constructions. This will, of course, involve determination of the rights which the State has, as distinct from those of the Federal government, and cooperation with the Federal government in effecting the power utilization of the river without impairment of navigation.

The Commission recommends an appropriation for the purpose of cooperation with the Canadian authorities and the Federal government in the study of the St. Lawrence River.

The situation on the Niagara River presents problems somewhat analogous to those on the St. Lawrence. The Commission believes that the crying need for additional power in the Niagara district, extending eastward as far as Syracuse, should stimulate action by the State. By the construction of controlling weirs in the rapids above the Falls, so as to throw toward the shores some of the water now passing over the Horseshoe Falls and causing their rapid recession, the scenic beauty can be enhanced, while at the same time large additional volumes of water may be utilized for power purposes.

It has been pointed out on another page that the special problems presented by the boundary waters may make it advisable for the State itself to build and equip power plants on these streams, to be operated either by lessees or the State.

Through the action of this Commission such limitations were placed upon the charters of the companies operating at Niagara Falls in the bills permitting their reorganization, passed by the Legislature in 1918, as will define their rights.

Stream Regulation a Public Use. Constitutional authorities have expressed some doubt regarding the adequacy of the theory of the State's duty to protect the health and safety of its citizens as a foundation upon which to proceed with stream regulation for power development. It accordingly seems advisable, in order to make the matter more certain, to amend the Constitution by declaring such regulation to be a public use.

Summary of Necessary Water Power Legislation. Much of the legislation that will be required before the water power policy outlined on the preceding pages can become effective is already clearly understood, and the suggestion is accordingly made that it be enacted as quickly as is consistent with due consideration of the various points by the Legislature. The Commission respectfully recommends that the Legislature now take the following action:

1. The immediate passage of appropriate legislation authorizing the Superintendent of Public Works, with the approval of the Canal Board, to dispose, for proper returns by lease, of surplus water power created as a result of the construction of the Barge Canals.
2. The revision of Article 7 and Article 7-A of the Conservation Law, to provide more effective means for the State regulation of stream flow by storage reservoirs, and for the assessment of the costs and the levying of charges upon those benefited in the manner required by the constitution.
3. The enactment of legislation to empower the Commission to construct power dams at sites where the State owns some interest, and to lease for proper rentals the potential power created both at such power dams and at storage dams, the leases being subject to revision at regular intervals.
4. The passage of a bill to amend the Constitution to provide that the water powers of the State shall forever remain the property of the State, and may be leased only for proper returns that are subject to revision at reasonable intervals.
5. The passage of a bill to amend the Constitution to provide that nothing contained in Article 7, Section 7, shall be held to prevent the development of power at State owned power sites, or the transmission of power across State land, in the Forest Preserve, under proper regulation.
6. The repeal of all water power charters heretofore granted by the Legislature and still unused, and legislation clearly defining the limits of rights under charters in use.

7. The appropriation of $10,000 to the Conservation Commission for the preparation of plans for the development of power in the St. Lawrence River in cooperation with the Dominion of Canada, the Province of Ontario and the Federal government.

8. The passage of a bill to amend the constitution by declaring that the regulation of stream flow by storage reservoirs is for the public welfare and use, as well as for the public health and safety.

BASIS FOR IMMEDIATE ACTION ON WATER POWER DEVELOPMENT

At the same time that the Conservation Commission advanced its suggestions on power policy a year ago, other plans were proposed by the New York State Council of Mayors. The Council of Mayors proposed that the State proceed with the actual generation of power at State owned power sites, and the transmission and distribution of that power to consumers. Their plan also provided for the State eventually taking over privately owned powers. This is a plan of tremendously far reaching consequences, and involves many intricate details, which require the most careful study before the enormous expense involved should be undertaken.

Without attempting to discuss here the relative merits of the two proposals, it is desired now to point out that, up to a certain point, the proposals of the Conservation Commission and those of the Council of Mayors run side by side. The purpose of this discussion is accordingly to show that it should be possible for the State immediately to go a long way forward in the development of water power without running counter to the theories of either side. In other words, the policies and steps upon which both sides are in agreement are those that are preliminary, and with which either side would immediately proceed, if its complete water power policy should be adopted. The Commission accordingly suggests that the State proceed at once with the preliminary phases of the work, upon which there is no disagreement, leaving disputed points to be settled later, when the subject has been more thoroughly discussed and understood. So much time will be occupied in these preliminary steps that there will be abundant opportunity for the people of the State to reach a sound conclusion regarding the advisability of the State going into the actual generation and distribution of power. Moreover, the nature of the preliminary steps, and the safeguards thrown about them, will leave the disputed points completely open for future determination. When this determination has finally been made, the preliminary steps will have been taken, and the State will be in a position to put the final details of the power policy into effect.

It is accordingly now suggested that all parties interested in power development in New York State proceed with the following:

1. *Control of stream flow by storage reservoirs, constructed, owned and operated by the State.*

    This is a work of tremendously vital importance, which underlies every plan for hydro-electric development. Inasmuch as it will take several years to make much progress in this direction, because of the large size of many of the most important reservoirs and dams, it is important that the work be started at once.

2. *The improvement of State owned power sites by the construction of power dams at State expense.*

    Power dams are permanent improvements and, inasmuch as many important power sites are actually owned by the State, the dams on them should be similarly State owned. If the State goes into the business of generation and distribution of current, it will have to construct these dams. On the other hand, if it is decided to lease power privileges at such sites, the State should nevertheless construct the dams as permanent improvements. The State would then be in excellent position at any time in the future, upon the termination of leases, to itself take over the generation and distribution of current at those sites.

3. *Preparation of engineering plans for the immediate development by the State of the enormous water powers on the St. Lawrence and Niagara rivers, and the institution of negotiations with the national government and Canada to clear away any obstacles in the way of such development.*

    The powers on the Niagara and St. Lawrence rivers are the largest in the State, and the most economical of development per unit of horsepower, with the possible exception of some of the surplus canal powers. Moreover, the market for a large part of this power already exists, and in fact there is urgent municipal and industrial demand for immediate development at these points. In addition, there is grave danger that if the State does not immediately proceed to secure its rights in these boundary waters, and act upon those rights, it may forever lose them to the Federal government. They are capable of paying to the State each year a substantial revenue, and this revenue should be secured for the people of the State.

Because of the complicated Federal and international questions involved, the Conservation Commission believes that in the case of powers in boundary waters, the dams and power plants should be constructed by the State, and that the best method of operation of these powers would be actual generation of the current by the State. The demand for all of the power that could be developed at Niagara Falls already exists in the immediate vicinity, and any power developed by the State at that point could be immediately sold at the bus bar. It is clear that such a procedure at the present time would not operate to prevent a different method of distribution of this power in the future.

The potential St. Lawrence power is so great that its most effective disposition requires careful study. This point, however, does not need immediate decision, since the preparation of plans, the clearing up of Federal and international questions, and the construction of a dam and power plant will consume much time.

The Conservation Commission believes that all of the steps here indicated for the development of the Niagara and St. Lawrence River powers are in accordance with the plan of the Conference of Mayors, as they are with that of the Commission. They should accordingly be undertaken immediately, since they are common to any hydro-electric plan yet proposed.

4. *The passage of general laws to provide for the leasing of the surplus waters of the Barge Canal.*

> Power is now available on the Barge Canal and is running to waste because provision has not been made for its utilization. There is great need for it, and if it should now be leased for reasonable periods, it could be at once utilized without in any way interfering with eventual generation and distribution of current by the State itself. At the end of any leasing period, which should not be unduly long, all rights would revert to the State. On account of the great demand for this power, and because of the fact that the dams are built, a longer delay in utilizing these surplus waters is wasteful in the extreme, depriving the municipalities and industries of the State of necessary power, and causing the State to lose substantial sums that might otherwise reach the treasury.

If this basis for immediate action is adopted, steps should be taken at once to clear away legislative and constitutional difficulties, and make these preliminary details of a common power policy effective, regardless of whether the plan proposed a year ago by the Conservation Commission or that proposed by the Council of Mayors, or some other plan, is to be the final State policy. The general nature of the steps necessary to put the preliminary details of this policy into operation are indicated on page 188, and it is accordingly not necessary to discuss them here. They can better be taken up by all parties concerned if a basis for action is agreed upon.

WATER SUPPLY AND SEWERAGE

Waterworks construction, which was practically stopped by the war, has not yet been resumed. Only seven applications have been filed during the year. Probably an amount of construction roughly measured by some forty applications has been deferred on account of war conditions. Expressed in other words, the waterworks program of the State in general is two years behind hand.

Legislation is recommend as follows:

1. To empower the Commission, in case of an emergency, to authorize the temporary use of an additional source of water

supply by a municipality or water company, such permit to be granted with the minimum of formality and the maximum of speed. The procedure specified by Article 9 of the Conservation Law requires considerable time. This is proper and works out advantageously in a normal case, but in certain emergencies which have arisen it has been necesary either for a municipality to do without water or to proceed with the acquisition and use of a temporary supply without authority from the State.

2. Enabling legislation to make effective the provisions of Article 7, Section 7 of the Constitution of the State, allowing the construction on State Forest Preserve land of reservoirs for the supply of water to communities. At least one such case is now in contemplation, but cannot be proceeded with until such legislation has been enacted.

Some eighty cases of plans for the discharge of sewage and trades wastes into the streams of the State have come before the Commission. This number is about 30 percent less than the normal and the plans have been chiefly for treatment works for trades wastes and sewage disposal plants for small institutions. In large measure these have resulted from the activity of this Commission in stream pollution matters and a campaign recently started for the improvement of sanitary conditions in rural school houses.

DOCKS AND DAMS

Jurisdiction over the docks and dams of the State, with the exceptions stated below, is conferred upon the Conservation Commission by Section 22 of Article 3 of the Conservation Law. Under this statute, before any structure for impounding water, or any dock, pier, wharf or other structure used as a landing place shall be erected or reconstructed, the Conservation Commission must be notified. When in its judgment public safety so requires, authority is also given the Commission to order the submission of plans and specifications, and the revision of such plans, or the removal, repair, or reconstruction of any such existing structure. The jurisdiction extends to all such structures within the State, except those forming a part of the State canal system; or except in the case of a dam where the area draining into the pond formed thereby does not exceed one square mile, unless the dam is more than ten feet in height above the natural bed of the stream at any point, or unless the quantity of water which the dam impounds exceeds one million gallons; and excepting a dock, pier, wharf or other structure under the jurisdiction of the department of docks, if any, in a city of the first-class.

During the calendar year 1918, the Commission has passed upon twenty-one applications for proposed dams and four applications for proposed docks. The task of reporting upon the condition of all existing structures within the State was continued by five summer employees under the direction of the Inspector of Docks and Dams. Such assistants locate the docks and the dams, and report as to their principal constructive details, the present condition, dimensions, and other data required. The Inspector personally examines structures reported as unsafe and also new structures.

During the past year, upon recommendations made by the Division of Waters, six dams and three docks have been condemned by the Commission and steps were taken to have them made safe.

WATER POWER AND STORAGE SURVEYS

The Division of Waters has continued during the past year the surveys and investigations of the water power resources of the State. Requests are received daily for information obtained by the Commission in the course of its studies of the power and storage possibilities of the Hudson, Genesee, Black, Beaver, Moose, Raquette, Saranac, Grass, St. Regis, Ausable, Chateaugay, Chazy, Salmon, Delaware, Oswegatchie, Indian, Schroon, Sacandaga, Mohawk and Oswego Rivers, and the Commission's engineers are in frequent consultation with engineers of private corporations, who wish to utilize the data being obtained.

Black River. The report on the "Power and Storage Possibilities of the Black River" has been completed and is about to be published. This is the most elaborate report of its kind that the Commission has ever issued and the number of requests for copies of the pamphlet indicate its great value.

Ausable River. A reconnaissance of some storage possibilities on the head waters of the Ausable River was made during the past season to supplement the survey of this stream made in 1917. In addition a revised water power census was made. The reconnaissance disclosed a reservoir site on Black Brook, where the drainage area is 49 square miles and where it would be possible to store about 400,000,000 cubic feet. A survey will be necessary to determine the feasibility of this storage. Two small storage reservoirs on the tributaries to Black Brook have already been constructed by power owners. A report on the power and storage possibilities of the Ausable River is in the course of preparation.

Ord's Falls Project. One of the most promising of the smaller storage reservoirs in the upper Hudson River watershed would be created by the construction of a dam at Ord's Falls, raising the level of Harris Lake and Rich Lake. A survey of this reservoir was made during the past season. It will be necessary to make a detailed study of the stream flow records to determine the economic capacity of this reservoir. If the reservoir is built before any power projects are developed on the upper Hudson River, the reservoir would undoubtedly be regulated so as to produce the best effects at Spier Falls, in which case it would be economical to have a greater capacity than if the reservoir regulated for some point farther up stream. The drainage area at the dam site is 195 square miles and the capacity of the reservoir would be from five to seven billion cubic feet. This reservoir, together with the proposed reservoirs on the Indian and Cedar Rivers, would practically completely control the flow of the Hudson River above the Kettle Mountain power site.

Schroon Falls Reservoir. A great deal of objection has been raised by cottagers in the past to the idea of the creation of the Schroon Lake reservoir, which involves raising the elevation of that lake about 33 feet by the construction of a dam at Tumblehead Falls. Accordingly the Commission's engineers have endeavored to locate other storage possibilities on the Schroon River. A survey has been made during the past summer of one such alternative reservoir, the Schroon Falls Reservoir. Little or no valuable land would be flooded by the creation of this reservoir. The drainage area at the dam site is 164 square miles.

As there are no feasible power sites at or immediately below the dam site, this reservoir would undoubtedly be regulated so as to produce the best effects near the mouth of the Schroon River, or perhaps for the center of gravity of power on the Hudson River. This method of regulation would justify a relatively high amount of storage, probably from five to seven billion cubic feet.

BLACK RIVER REGULATING DISTRICT

Article VII-A of the Conservation Law, entitled "River Regulation by Storage Reservoirs," makes possible the creation of any watershed of the State into a river regulating district under the jurisdiction of a Commission, consisting of the Conservation Commissioner, the State Engineer and Surveyor and the Attorney General.

Pursuant to the provisions of this article, there was filed with the above Commission on March 13, 1919, a petition signed by the City of Watertown and various villages and private corporations, praying for the creation of the Black River Regulating District. After due notice, a hearing in this matter was held on April 15, 1919, at which time the petitioners submitted evidence to show the necessity for the regulation of the flow of the Black River and its tributaries. No objections, either oral or written, to the creation of this district were made. After due consideration of the evidence in this matter, the Commission made, on May 7, 1919, its determination that the purposes of Article 7-A of the Conservation Law would be subserved by the creation of a river regulating district as prayed for, and ordered that the said district should be known as the Black River Regulating District and that the extent thereof should be the watershed of the Black River and its tributaries.

This final order and determination, together with a map of the district, was filed with the Secretary of State and with the county clerks of each of the counties wholly or partly within the district, and notice given of the final order and determination and of the filing, by publication, in two papers in each of the counties affected.

Section 434 of Article VII–A provides that, unless within forty days after such filing and publication of notice thereof, proceedings have been taken by a person who is a free-holder within such proposed district, or by a public corporation therein upon notice to the Attorney General of the State, or by the Attorney General of the State, to review the determination and order of the Commission by certiorari, such determination and order shall be final and the district shall thereupon be a river regulating district of the State of New York, and a public corporation with all rights and powers granted by this article.

The filing above referred to was completed on June 11, 1919, and the publication of notice was completed on July 5, 1919. The forty day period ended at midnight August 14, 1919, and no proceedings to review having been taken, the Black River Regulating District was duly incorporated. On September 9, 1919, the Governor appointed the members of the Board provided for by the statute. The Commission and its engineers have had several conferences with this Board and have furnished it with maps, plans, estimates, etc., as required by the statute.

DRAINAGE

Orange County Project. The Commission received on October 10, 1919, a petition signed by the owners of the swamp lands lying adjacent to the Wallkill River, south of Middletown, in the towns of Wallkill, Wawayanda, Goshen, Warwick and Minisink, praying that these lands be formed into the Orange County Drainage Improvement District.

These lands have an area of over 17,000 acres and form, perhaps, the largest swamp in the State excepting only the Montezuma marshes. The Commission's engineers made a reconnaissance of this swamp and found that most of the soil was a fine quality of muck and that on the outskirts of the swamp a great deal of onions, celery and lettuce was grown. Because of the fact that these lands lie so close to a large stream, the problem of protecting them from floods and of draining them is unusually difficult. A survey to determine the cost and feasibility of the project is now under way.

Porter-Lewiston Project. On July 19, 1919, there was filed with the Commission a petition signed by the owners of a majority of the lands in need of drainage along Four Mile Creek in the towns of Porter and Lewiston, Niagara County. The Commission's engineers made a reconnaissance of these lands and learned that they constitute about 4,000 acres, most of which is under orchard and general farm cultivation. However, because the ground surface is so flat, the water from the heavy rains cannot quickly drain away and consequently prevents the owners from getting in their crops and, in addition, does considerable damage to the existing orchards. Thereupon the Commission determined that the work was of sufficient importance to warrant the interference of the State and ordered a preliminary survey of the project.

This survey has been made during the past summer to enable us to determine the feasibility of the project and an estimate of the cost of the necessary improvements is in the course of preparation.

Capen Project. A petition was filed with the Commission on October 16, 1919, praying for the creation of the Capen Drainage Improvement District. This district would include about 4,000 acres of wet lands in the towns of Wilson and Newfane, Niagara County. A reconnaissance of this area was made by the Commission's engineers but it is doubtful if a survey can be made until another year, inasmuch as it is expected that the work on the other drainage projects will exhaust the funds for this work.

Drainage Legislation. Early in 1918 the State conference of County Farm Bureau managers recommended the appointment of a committee by the Vice Director of Extension of the State College of Agriculture at Cornell University to study drainage legislation and make recommendations in regard thereto to the Legislature. The Division Engineer was appointed a member of this committee and the Conservation Commission, through the Division of Waters, cooperated in its work. The committee first took up the question of the advisability of amending Article I, Section 7 of the State Constitution and, acting upon their recommendations, a joint resolution was passed by the Legislature of 1918 and 1919 and was submitted to the voters at the last election. The amendment declares that the drainage of swamp or agricultural lands is a public purpose and gives the Legislature authority to pass general laws in regard thereto, providing for the assessment of benefits against the property benefited. This amendment was considered by the committee as fundamental in view of the decision of the Court of Appeals in the Tuthill case, 163 New York 133.

The committee also submitted a bill which provided that any person or persons owning swamp or other wet agricultural lands, that could not be drained except by crossing lands of adjacent owners, and who could not agree with owners for the right of way upon which to construct drains or ditches, might petition the Conservation Commission, which would proceed to assess the damages resulting from the construction of such drains and ditches, and upon the payment of said damages the petitioner would be permitted to proceed. This act became a law on May 6, 1918, and was incorporated in the Conservation Law as Article 8-A. The theory upon which this law was based is analogous to the case of the private road provision of Article I, Section 7 of the Constitution.

In 1919 the committee studied the question of the revision of the drainage section of the Conservation Law, and presented a bill, which the Legislature passed, revising that section, which became a law on May 9, 1919, and replaces Article 8 of the Conservation Law. The principal change made was the insertion of provisions for the determination and adjustment of benefits as a basis for assessing the cost prior to the selling of bonds or the execution of construction work. This procedure is characteristic of most of the statutes of the western States, under which large areas of land have been reclaimed.

CANASERAGA CREEK IMPROVEMENT

The proceedings to review the Commission's determination of benefits in the Canaseraga Creek Improvement Project have been continued before the referee during the past year.

The 1919 Legislature appropriated funds to meet the financial obligations of the district up to July 1, 1920, pending the decision of the referee, and for maintenance work and the expenses of litigation.

The maintenance operations, which were discontinued in July, 1918, on account of lack of funds, were resumed in June, 1919, and this work is now in progress. The work consists of the construction of dykes, bank protection and the cleaning out of drainage ditches. Experiments were made last spring in cooperation with the Dupont Powder Company to determine the feasibility of cleaning out ditches by use of explosives. These experiments demonstrated the practicability of this method for some classes and conditions of work and about three-quarters of a mile of ditches eight feet wide was cleaned out in this way during the past season. The Commission's engineers have recommended the purchase of a light excavator for the purpose of maintaining this project more economically, but this cannot be done until the finances of the work have been put upon a firmer basis by the settlement of the litigation or otherwise.

HYDROGRAPHIC INVESTIGATIONS

Hydrographic investigations have continued in cooperation with the State Engineer and Surveyor and with the Water Resources Branch of the United States Geological Survey. The funds appropriated for these three bureaus were pooled, and the records have been obtained under the immediate direction of the district office of the Geological Survey. Material assistance has also been given by power companies, municipalities, and private parties interested in stream gaging work.

During the past year stream flow records have been obtained from 53 different stations, giving a total of 604 months records, or an average of 11.4 months per station. Over twenty stations have been equipped with recording gages. Other stations are in need of this equipment and many other sections of the State are in need of some type of station.

The industrial conditions which have developed during the past few years have created an unusual demand for power. The increasing cost of coal, and its uncertain delivery, have had a tendency to direct more attention to the hydro-electric field. These conditions, together with the needs of the industrial world for a supply of potable water, tend to emphasize the necessity for increasing the scope of the hydrographic work.

GENERAL ENGINEERING

Long Point Dock. An appropriation was made by the Legislature of 1919 for the construction of a new dock on the St. Lawrence reservation. It was decided to build this dock at Long Point, Chaumont Bay, a locality greatly used for recreation purposes. Plans were accordingly prepared, the contract let, and the dock was completed in September, under the inspection and supervision of the engineers of the Commission.

Fish Hatchery Surveys. The land surrounding several of the State Fish Hatcheries has not been surveyed for a good many years, and accordingly it was thought advisable to run out the property lines. During the past year the State property at the Constantia and Caledonia hatcheries was surveyed and monumented. It is planned to continue this work the coming year.

Dunkirk Fish Hatchery. The Division of Waters was called upon to prepare plans and set grade stakes for the grading of the fish hatchery grounds and for driveways and walks. This work was done in May and June, and much of the construction work has already been completed under supervision of the Division of Fish and Game.

Adirondack Hatchery. Plans and estimates have been prepared for the construction of the water supply works at this hatchery. Measurements of existing supplies were made and possible new supplies investigated. Plans include a new piping and pumping system, by which it will be possible to control the temperature of the water used for hatching purposes and the respective quantities taken from Little Clear Lake and from the various springs to be utilized. The proposed new construction will include about 2900 linear feet of 10-inch pipe, a new pump of 100 gallons per minute capacity and a new pump house and mixing chamber. It is expected that these improvements will make it possible to at least double the capacity of this hatchery.

State Land — Water Power Estimates. It frequently happens in the purchase of lands in the Forest Preserve under the $7,500,000 bond issue that water power rights are involved. The Commission's engineers have made reconnaissances, surveys, investigations and reports on several of these proposed land acquisitions.

Lake George Regulation. The Commission has received several complaints from cottage owners on the shores of Lake George of damage done by high water to their docks and of erosion to the shores. These high water conditions have also caused erosion of the islands in Lake George, most of which are owned by the State. A careful study of the problem was made by the Commission's engineers, in conjunction with the Division of Lands and Forests, and a tentative arrangement made with the International Paper Company, which owns the dam which controls the elevation of the lake. It is believed that this agreement will remedy the conditions described above. By the terms of this agreement the International Paper Company undertakes to so operate the flood gates that the water in the lake will never rise higher than an elevation corresponding to eight inches above the crest of the dam. A further investigation will be made the coming spring to determine whether any material damage will be done if the lake does not exceed this elevation. During the past year the water exceeded this elevation for four months and rose to a maximum elevation of eighteen inches above the crest of the dam. The benefits which will accrue to both State and private property by reason of this agreement with the International Paper Company are obvious.

DIVISION OF SARATOGA SPRINGS

DIVISION OF SARATOGA SPRINGS

J. G. Jones	*Superintendent*
C. B. Elmore	*Secretary*
Herbert Ant	*Chemist*

DIVISION OF SARATOGA SPRINGS

SUCCESSFUL OPERATION

The year just ended has been the most successful ever experienced at the State Reservation at Saratoga Springs. This is true of the condition of the springs themselves, for the protection of which the Reservation was originally established. It is true of the number of people who took treatments at the State bath houses and drank the waters at the Drink Hall or springs, the patients and visitors this year far exceeding those of any previous season. It is true also of the general physical condition of the Reservation itself, which during the past year has been considerably improved in many important respects. And finally, in spite of the greatly increased cost of labor and all materials, the income producing departments of the Reservation have this year paid a net profit in excess of that of a year ago.

The Commission accordingly feels that the Reservation is in a most healthy condition, and that definite progress has been made toward the ultimate goal of making the Reservation the best equipped and most important mineral water health resort in America. In the quality of the waters, it is second to none of those in Europe. With the equipment now installed, and to be provided in the future, we may confidently expect that Saratoga will occupy a position equal in every respect to that of the best European spas.

INCREASED BUSINESS

The total number of treatments given at the State bath houses during the calendar year of 1919 were 36,808, in comparison with 23,305 for the preceding year. This is an increase of 58 percent.

The giving of such a large number of treatments requires the use of an enormous volume of mineral water each day, more, in fact, than the springs now utilized will yield during that portion of the day when the baths are given. The requisite amount of water is accordingly made available for immediate use by collecting the flow of the springs throughout the twenty-four hours in immense storage tanks, hermetically sealed to prevent any loss of carbon dioxide gas. A year ago the giving of as many treatments in one day as was demanded this year would have been quite impossible, because of inadequate water storage facilities. This year, however, prior to the rush of the summer, new storage tanks for the Washington bath house, then under construction, were completely installed, and it was possible to connect them with the piping system of the Lincoln bath house, to care for the peak load of August. These new storage tanks, which were fortunately obtained from the manufacturers barely in time, accordingly saved the Commission from complete inability to handle the unexpected number of patients who presented themselves at the bath houses during the busiest month.

A comparison of the number of treatments given at the bath houses in the calendar years from 1914 to 1919 will indicate clearly the important place which Saratoga has recently gained in this field.

Treatments Given In State Bath Houses From 1914 To December 31, 1919

Calendar year		Number of treatments
1914	Bath houses operated by former State Reservation Commission	7,843
1915	Bath houses operated by former State Reservation Commission	11,292
1916	Bath houses operated by Conservation Commission	17,081
1917	Bath houses operated by Conservation Commission	21,959
1918	Bath houses operated by Conservation Commission	23,305
1919	Bath houses operated by Conservation Commission	36,808

A further indication of the increased business of the year, and of the general tendency of Saratoga's development, is found in the fact that the number of treatments given at the State bath houses in July, 1919, was greater than those of August, 1918, though August is always the biggest month of any year. It is equally significant that, whereas the bath houses had practically no business after September first in former years, this year the number of treatments given in September exceeded those of July of last year. This means that more and more people are looking to Saratoga for the things that Saratoga has promised. It means that eventually the cure season of Saratoga will include not simply the few months of warm weather, but actually the entire twelve months of the year.

In the period from July first to October first, it is estimated that 200,000 people visited the Drink Hall. The enormous increase in drinking the waters at the various springs themselves is shown by the number of paper cups used. The total number of cups used for the fiscal year 1918–19 was 406,250, while for the first quarter alone of the present fiscal year 417,000 cups were used. These figures, of course, do not cover the large number of people who brought their own cups or glasses.

The total remittances for the first five months of the fiscal year, beginning July 1, 1919, were $69,998.37. When it is considered that the remittances for the corresponding period of the fiscal year beginning July 1, 1918, were $41,076.95, the increase in usefulness of the Saratoga waters to the people of the nation is evident.

That the cure season at Saratoga is being extended into the fall of the year is also proved by the total gross receipts of $12,271.82 for September, 1919, as against $5,233.23 for September, 1918, a gain of over 134 per cent over last year. October, 1918 showed total receipts of $3,861.36, whereas October, 1919 showed total receipts of $5,566.45, an increase of 44 percent.

A comparison of cash remittances to the State Comptroller from 1914 to November 30, 1919, given in the following table, is another indication of the increasing use of the State's resources at Saratoga Springs by the general public.

Remittances To Comptroller From 1914 To November 30, 1919

Fiscal year		Amount
1914	By State Reservation Commission........	$1,085 33
1915	By State Reservation Commission........	14,891 22
1916	By Conservation Commission, July 1, 1916 to June 30, 1917....................	59,518 05
1917	By Conservation Commission, July 1, 1917 to June 30, 1918....................	63,495 67
1918	By Conservation Commission, July 1, 1918 to June 30, 1919....................	81,352 48
1919	By Conservation Commission, July 1, 1919 to December 30, 1919 (6 months)......	74,308 38

NET PROFITS

The income producing departments, which are the Mineral Water Division, the Bath House Division, and the Miscellaneous Division, show a net profit for the fiscal year ending June 30, 1919, amounting to $8,152.50. This is an increase of $3,317.94 over the profits of a year ago, and represents a profit of over 5 percent on this year's operating expenses of the income producing departments. It is an increase of 6.6 percent over the profits of a year ago. This profit has been made in spite of the fact that wages and costs of all kinds have increased from 10 to 80 percent as shown by the following table:

Increased Costs Of Operation

	Cost for year 1917–1918	Cost for year 1918–1919	Percentage of Increase
Laborers wages, per day (average).	$2 25	$2 75	22½
Coal (pea size), per ton (average).	7 60	9 10	20
Freight and express (average)....	08	10	20
Bottles, per gross (average).......	4 00	4 75	19
Demijohns and crates, each.......	1 10	1 40	27
Packing boxes, each	35½	55½	57
Crowns	37	53	43
Sheets (other linen in proportion) per dozen	11 00	13 50	22½
Turkish towels, per dozen........	4 62	8 25	80

Oil, ice, washing alkali and other small items increased from 23 percent for alkali to 67 percent for ice.

Salaries, average increase for Civil Service employees, 10 percent.

The profit of the year comes principally from the Bath House Division and the Miscellaneous Division. In view of the fact that the bath house receipts have so far come chiefly in the summer, though the season is constantly lengthening both in the spring and fall, it is confidently to be expected that the income from this department will steadily increase as Saratoga becomes more nearly a year around resort.

A detailed statement of costs of operation and income in the income producing departments, and of the operating expenses of the departments not producing income, is given on page 251.

FUTURE DEVELOPMENT

It was pointed out in the Annual Report of a year ago that the policy of the Conservation Commission in its administration of the State Reservation at Saratoga Springs was to build permanently and for the future. Evidences of this policy as it has been carried out during the past year, will be found in the following pages.

In order that the development of the Reservation might proceed in accordance with a definite and logical plan, much time has been devoted during the past year, in cooperation with the State Architect, to a study of all of the needs and possibilities of the Reservation, with the result that a tentative plan has been evolved, which can be readily visualized in the accompanying illustration on page 218. This plan provides for the eventual construction of a new bath house and drink hall, of a hotel which can be operated in conjunction with the bath house, of harmonious landscape treatment of the surrounding territory, and of a drink hall in the town. The plan is very comprehensive, and it will take a number of years to work it out. It is only by starting with a comprehensive plan, however, that a unified and consistent development can be accomplished. The Commission accordingly recommends that the Legislature give

The State Reservation at Saratoga Springs, When Fully Developed, Will Rival the Famous Spas of Europe.

careful consideration to this entire subject, and that the first steps be taken immediately for the final development of the Reservation.

It should not be forgotten that New York State has an investment of approximately one and one-half million dollars in lands and springs at Saratoga. While certain buildings were taken over with these lands and springs, and have since been utilized for bath houses, bottling works, and drink hall, these buildings were nevertheless is such a dilapidated condition when acquired, and so manifestly temporary structures, that they cannot properly be considered as an important part of the original acquisition. Accordingly, with an investment of one and one-half million dollars in real property alone, it is surely logical to look forward to the time, which should be in the near future, when the State will construct upon this property adequate facilities for taking the treatments that the springs make possible. The rapid increase in the number of persons visiting Saratoga for the treatments there offered, the consequent overcrowding of the present bath houses and drink hall, and the temporary and make-shift character of all of the buildings, except the new Washington bath house, which has just been completed, surely make it incumbent upon the State to meet the necessities of this situation as a duty, not only to its own citizens, but to the nation at large.

THE DRINK HALL

Arrangements were made at the Drink Hall last winter for the storage during the winter months of palms, ferns and other ornamental shrubs by residents of Saratoga, and these plants increased the attractiveness of the place to a considerable degree.

Early in the summer, a system of turnstiles was installed, in order to keep an accurate count of the number of visitors. From July 19, 1919, when the turnstiles went into operation, to October 1, 1919, the total number of persons entering the Drink Hall was 154,382, and it is estimated that enough more entered the building between July first and October first to bring the total for the first three months of the fiscal year to at least 200,000. During the same three months, the cash remittances and sales of bottled water at the Drink Hall amounted to $9,384.80, which exceeded the receipts of the entire preceding fiscal year by $1,544.45.

The Drink Hall has become more and more popular, as its attractiveness and convenience have increased, and a considerable amount of patronage during the spring and winter months, coupled with its overcrowded condition during the height of the season, have shown clearly the necessity for planning the early erection of a Drink Hall which will be adequate at all times.

SARATOGA BATH HOUSE

At the Saratoga bath house, as well as at the Lincoln baths, and the new Washington baths, a new and much more efficient method of heating the mineral water baths has been installed, after about two years' experimenting along these lines. The cumbersome copper coils, which were raised and lowered into the tubs with considerable difficulty, have been done away with and for them has been substituted a very light and easily handled apparatus of perforated pipe and wire mesh, which heats the bath water in the tub with live steam even more quickly and satisfactorily than did the old system.

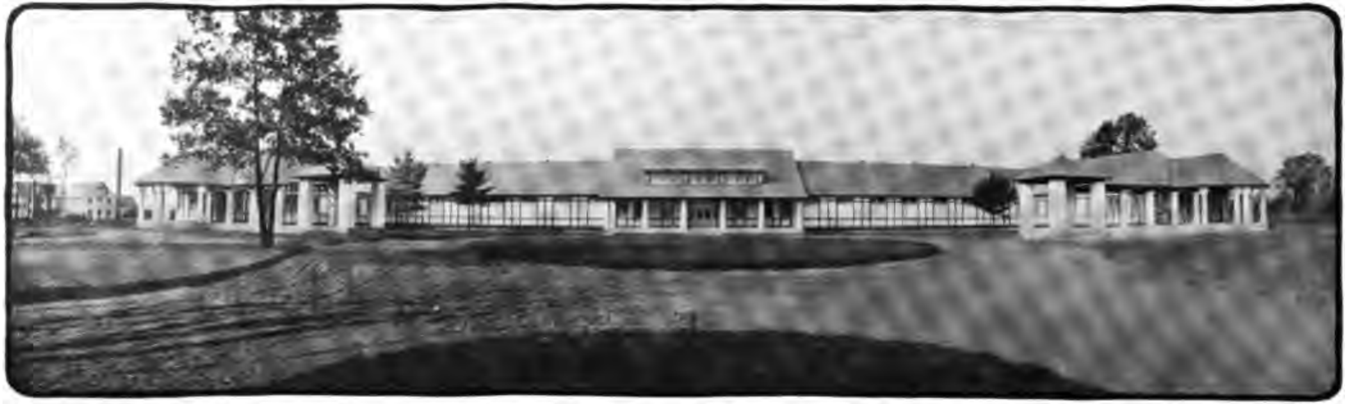
During the winter of 1919, at the Saratoga bath house, the entire piping system for mineral water, plain water and steam supply and the old waste pipe system were removed and renewed. In installing the new piping a considerable improvement was effected in the design of these systems, making them now completely accessible for repair and examination. This has been found to be a very essential feature of design in connection with mineral water piping.

A double-walled building has been constructed about the pressure filter on the city water supply line to the Saratoga baths, so that it is now possible to use this filter throughout the winter without danger of freezing. This has been made necessary by the continued use of the indoor swimming pools throughout the winter by various local organizations. It is impossible to use the city water supply in these pools without filtering, because of its color.

Two mineral water storage tanks were removed from the Lincoln bath house and installed in the Saratoga baths to replace two tanks already there, which, because of the corrosive action of the mineral water and gas, were no longer in condition to withstand the required pressure. It was possible to remove these tanks from the Lincoln baths, as that bath house is now supplied direct from the 16,000-gallon high pressure storage tank installed in the heating plant at the Washington Baths, which is now used in common for both bath houses.

During the year a very serious condition developed at the Saratoga bath house, which threatens the continued stability of the entire structure. The foundations of the building, which were erected in 1891, are laid upon inclined sub-strata, and it was discovered very soon after the Conservation Commission took over the Reservation in 1916, that the walls were settling and that the building was slowly but steadily slipping down hill. This resulted in continual difficulty with the plumbing, which has developed leaks from time to time, necessitating much repair and a considerable amount of redecorating on account of staining of the walls. When the instability of the foundation was first discovered by this Commission, a careful survey of the walls was made by the engineers of the Commission and marks were made for the purpose of checking any subsequent changes. It became apparent this fall that the building had settled much further, and the State Architect was accordingly requested to make a complete examination. He did so, checked the original marks of the engineers with the present conditions, and on October 31, 1919, notified the Commission that the building must be very thoroughly strengthened if it is to remain in continuous operation.

The State Architect advised a set of concrete buttresses to be placed against the east wall of the building. These buttresses, however, would have had to be placed on property of the New York Telephone Company, and it finally developed that, on account of anticipated extensions to their own building, the Telephone Company could not permit the erection of buttresses. The State Architect has accordingly stated that the only other feasible means of properly strengthening the building is to build an interior system of concrete and steel bracing walls. This will necessitate closing the bath house, tearing down some of the interior partitions, and building new partitions of reinforced concrete. The



THE NEW WASHINGTON BATHS OF THE STATE RESERVATION AT SARATOGA SPRINGS ARE BUILT PERMANENTLY AND FOR THE FUTURE, AND NOW OFFER FACILITIES MORE COMPLETE AND COMFORTABLE THAN ANY OTHER BATH HOUSE IN AMERICA.

whole process will be expensive, and at best will be in the nature of patching up an antiquated building. There is also the possibility that whatever steps are taken to strengthen the walls may not permanently overcome the insecurity of the foundation, and ultimately it may be necessary to tear down the entire structure.

The Commission is giving careful consideration to this entire subject, with the idea that ultimate economy and the future development of the Reservation may make it seem advisable to discontinue the operation of the Saratoga bath house. The Reservation is in a particularly fortunate position to do this without serious impairment of its facilities, because of the new Washington bath house, which will make it possible during the coming season to care for all of the business anticipated, even though the Saratoga bath house may be closed. Moreover the Washington Baths is a thoroughly modern structure which can be used in winter as well as in summer.

WASHINGTON BATHS

The largest work of construction carried on during the past year has been the alteration and repair of the old Natural Carbonic Gas plant into a modern bath house now called the Washington Baths, and the erection of a new heating plant in connection with it. Work on these two buildings was begun in October, 1918, and advanced to such a point that it was possible to open one wing of the Washington Baths for the last two weeks of August, thus giving additional bathing facilities as well as furnishing to visitors an excellent opportunity to inspect the building and see for themselves the modern equipment and improved facilities which will be available when the new bath house is entirely opened to the public for the season of 1920. There still remains to be done on this building about ten weeks' work, which will be completed early in the spring. The unfinished work consists principally of plastering, rotunda decorating, hanging interior doors, surfacing floors, installing and adjusting hydrotherapeutic apparatus, some painting, and other minor finishing jobs.

The bath house is a beautiful structure of concrete and stucco, and is designed as a permanent feature in the ultimate development of the Reservation. The building is in the shape of a wide letter "H" with the main entrance lobby and offices in the center and the dressing room sections each side of them. The bath rooms are in each rear wing and the rest rooms in each front wing. Entering the lobby, the visitor sees on either side the office of the bath house superintendent and the physician's consulting rooms. Separated from him by rows of massive pillars are waiting rooms for men and for women. From these waiting rooms lead the corridors to the dressing rooms, which are finished entirely in white enamel, including woodwork, furniture and equipment. The floors of this section are a light gray concrete with green linoleum runners.

After the patient leaves his individual dressing room, he is conducted to the bath rooms, which have also been finished in pure white — even to the concrete floor. The bath tubs are all white porcelain, with nickel plated fixtures, and are built into the walls of the bath room. It is necessary to use pure porcelain tubs because this is one of the few materials which successfully withstands the corrosive action of the carbonated mineral water. All around the bath room wings the concrete floor is carried up to a height of about eighteen inches at the sides. This, with the built-in type of tub, does away with any possibility of water or dampness collecting anywhere in the building.

In the rear of the bath room wings are several complete suites, including dressing room, bath room and rest room. Here the patient, by a payment of a slight additional charge, can do away with the necessity of passing through the corridors from the dressing room to the bath room sections and back to the rest rooms.

The general rest rooms are located in the front wings, on each side of the building, and are divided into alcoves, containing two or three couches each, thus securing a considerable amount of privacy and allowing complete relaxation for the patient. In the front of each rest room section is a solarium, furnished with rugs and with wicker tables, easy chairs and rockers for those who prefer the easy chair to the couch for their rest period. The color tones throughout the whole rest room section are green and white, a combination very restful to the eye.

The outside of the building is finished in white stucco with dark brown half-timber work. Pergolas finished in dark brown wood, with massive white concrete pillars, and columns supporting the semi-circular porches on either wing, lend a pleasing touch to the otherwise severely straight lines of the building.

The piping systems for mineral water, plain water, steam supply and waste water, the sanitary sewage lines, and all electric current mains, are completely accessible to examination and repair in a roomy electric-lighted subway, extending the whole length of the building. This feature removes from the main floor of the bath house any possible noise or heat from these lines and also makes them quickly accessible to the engineer in charge, without passing through any part of the bath house proper.

Throughout the building and its equipment modern methods have been followed and the very best of materials obtainable have been used, which, in connection with the improved design, should cut down to a very low point the operating and maintenance costs for this plant.

HEATING PLANT

The heating plant, which has been constructed in connection with the new bath house, is designed to supply and control both the Washington baths and the nearby Lincoln baths. It contains a battery of two water tube boilers, in connection with a 54-inch steel stack, 30 feet high, and an induced draft fan of 23,000 cubic feet per minute capacity. This equipment constitutes a steam plant capable of generating 250 horsepower. In addition to this steam plant, there has been centered in the heating plant complete control of the supply of mineral water, steam and electric current for the two bath houses. Here is located the new 16,000-gallon, high pressure mineral water storage tank, and the high pressure pumps, the electric control apparatus to the various deep well pumps, and all of the steam traps and feed water pumps for use with the boiler plant, giving the engineer in charge absolute control of the mechanical features of the whole installation.

THE BOTTLING PLANTS

Each year sees a large amount of experimental work done in the bottling department, with the fixed idea of improving facilities and increasing the economy of operation and maintenance in these plants.

It has not been deemed advisable to spend a great deal of time or money in attempting to improve the old building in which the Mineral Water Bottling Works is at present located, because it is hoped within a very short time to start construction on a modern bottling works building to be located at a point much more accessible than the present building, both as to piping of the waters to the bottling department and proper handling and shipment of the waters from the packing rooms. The new bottling works should also contain sufficient storage space for bottled water, so that the constant daily operation of the plant at a reasonable and economical rate of production may be insured. This will do away with the present unsatisfactory procedure of overworking the plant during the summer and fall and then letting the machinery lie idle for a considerable number of days each month during the remainder of the year, because of inability to ship waters on account of cold weather, freight embargoes and other causes outside our control.

The pipe lines from the various springs to the Mineral Water Bottling Plant have become so corroded and pitted by the action of the mineral waters that it will be necessary to renew them throughout before the rush season of 1920. To this end research is now being carried on to find the pipe best suited to withstand the action of these waters and at the same time retain the entire gas content as it flows from the spring. In renewing them, these pipe lines will be so laid as to make them available for future use in connection with a new bottling plant.

At the Ferndell Bottling Plant, the water is so very low in mineral content that it has an unusual affinity for iron, and because of its very purity, attacks the iron tanks and piping throughout the building, giving the water an unnatural iron content and causing a great deal of trouble in securing good bottled water. After considerable experiment a glass lined storage tank was installed and block tin pipe put in throughout the building to convey the water used for bottling purposes. After the installation was completed no further trouble from the corrosive action of the water was encountered.

WELLS, SPRINGS AND PIPE LINES

The work of maintaining and carefully regulating the flow of the various wells and springs is being constantly carried on. The iron casing was renewed on Well No. 7 of the Natural Carbonic tract, as the old casing had become so disintegrated by the action of the mineral water that a considerable amount of sand and clay was entering the well through holes in the casing. This well has formed a very valuable addition to our bath water supply, because of the large amount of water available from it, and it was thought to be good economy to renew the casing, rather than to abandon the well, as this would assure its availability for a number of years to come.

On the Lincoln tract, the casings of several shallow wells which were of no value as mineral water producers were cut off and the walls covered over to improve the appearance of the lawns. In Congress Park, the casings of Congress No. 3 and Columbian wells were cut off and these wells also were covered over, as they had proved to be of no value as drinking or bathing waters.

Throughout the past season the Lincoln water from the bath house pipe line has been served at the pavilion on the former site of the Columbian spring.

On account of its great similarity to the Geyser spring, and because it constituted an unwise drain on that valuable well, the Minnonebe spring was filled with concrete and closed, completing the work which was begun on this spring last year.

The New Red spring, north of High Rock Park, was also closed and filled with concrete. This was done because the spring was a very shallow one, and at various times signs of pollution from surface waters have been evident in the water. The spring itself had not been allowed to flow for a considerable number of years, and residents of that section of the city are amply supplied from the Old Red spring nearby, which is entirely safe for public use.

During the year it was found necessary to renew the inner tubing of the Hayes, Champion No. 1, Emperor, Pandora, Peerless and Pump Well No. 5 wells, and in retubing nearly all of these wells copper steel pipe was used. While the copper steel pipe has not proved completely satisfactory in withstanding the action of the mineral water, it is the best material for our purposes that has been discovered to date.

Improvements and enlargements of the bath water supply system, made necessary by the rapidly growing business of the bath house department, have been completed. The mineral water lines from the deep well pumps to the low pressure storage have all been put below any posible danger of freezing. One new pumping outfit has been added and arrangements made for bringing the large steam driven deep well pump on the Lincoln spring proper into the system direct. The headers and mains to low pressure storage have been increased in size and extra heavy pipe has been installed from the low pressure system through the pumps to the high pressure tank, which will now act as a storage reservoir for the Lincoln and Washington bath houses, leaving only the Saratoga bath house to be supplied from the low pressure lines. The Saratoga baths has its own high pressure system, complete with power driven pump and storage tanks. In installing this new system, valves and controls have been so placed that it is possible to close down for repairs or changes to any part of the system, without impairing the usefulness of all remaining portions, thus insuring a constant supply of mineral water to the various bath houses. If the heating plant and enlargement of mineral water system had not been completed, the Commission could not have taken care of the enormous increase in the business of Lincoln and Saratoga bath houses.

As an experiment, about 180 feet of asphaltum coated cast-iron, bell and spigot, water pipe has been installed in the wooden pipe line for mineral water leading to the Saratoga baths. This has been done to determine the action of the waters on pure cast-iron, thick walled pipe, over a considerable length of time.

About the Lincoln tract also has been installed new cast-iron water lines for fire service, and hydrants have been so placed about all the buildings that the best possible protection against fire loss is insured. This work has been done after consultation with the city fire officials as to the best means of securing this protection.

THE CHEMICAL LABORATORY

During the year an important part of the work of the chemical laboratory has consisted of further research to secure a material for our pipe lines and storage tanks which will resist the action of the various mineral waters. It has been found that there are two phases of the problem to be considered. First, a material must be secured which will resist the corrosive action of the strong salines and the carbon dioxide gas under high pressure. Second, the material must also resist the action of a comparatively soft surface water highly impregnated with vegetable organic acids, which is constantly in contact with the pipe lines from the outside. The latter of these two problems is perhaps the most difficult to solve, especially when a minimum of expense is one of the conditions of installation. There are several metals which will withstand completely the action of both the mineral waters and surface waters, but in these the cost of installing several miles of various sizes of pipe, from one and one-quarter inches up to four inches, would be absolutely prohibitive.

In previous years, wood, wrought iron, steel and copper have been thoroughly tested, but none of these materials has proved entirely satisfactory. Of this group, wood resists the corrosive action the best, but the wooden pipe lines do not give satisfaction because of the impossibility of maintaining a perfectly tight joint and holding the gas in the line under pressure. Without the presence of this carbonic acid gas, the mineral content of the water begins to precipitate out, giving cloudy, muddy looking water, which cannot be used for bottling or bathing purposes.

Copper serves well where the water is not to be taken internally, but it is not considered good practice to use it on drinking waters, because of the appreciable quantities of copper dissolved by action of the gas.

The latest thorough test has been of a copper steel alloy. This gave excellent service for several years, but now appears to be disintegrating, largely because of the acid-impregnated surface waters outside of the pipe.

Block tin line pipe is ideal for resisting the action of the mineral water, but to resist the surface water, a block tin outer cover, beside the lining, would be necessary, again making the cost of installation practically prohibitive.

Recently there has been installed a section of cast-iron water pipe, heavily coated both inside and outside with asphaltum. It is hoped that this may solve the problem for lines of large diameter, but the test has not been under way long enough to secure any reasonable data on this subject.

The usual control work on the springs and the weekly partial analyses and annual complete analyses of the various waters used for bottling and for bath water have been carried on. During the year complete analyses have been made of the Lincoln, Peerless and Hathorn No. 2 springs, and two complete analyses have been made of the Geyser, Coesa and Ferndell water. Bacteriological and microscopic examinations of the Ferndell water are being constantly made.

PARKS AND ROADS

Throughout the year the work of developing and improving the parks of the State Reservation has gone steadily forward. It is the policy of the Commission to take up various portions of the State's property in succession and develop each part in a way which seems best adapted to the uses to which it is to be put, and also in such a way that each part will fit easily and naturally into a harmonious whole. With this in mind, the work of filling and grading, and the making of additional parking space for automobiles about Coesa and Hathorn No. 3 springs, was completed early in the summer.

Just south of the Geyser Bottling Works, bordering the State road, the unsightly growth of white birches, alders and other brush was cut down and the area reforested with white pines from the State Forest Nursery. This nursery, which is operated by the Division of Lands and Forests, is being moved from its present position between Coesa and Geyser springs to a new location at the extreme southern end of the Reservation. This will allow the scheme of park development to be carried along the entire eastern side of the State Highway from Hathorn No. 2 spring to the Geyser Bottling Works, giving to visitors, approaching from the south, a very pleasing first impression of the State Reservation.

In Geyser Park, where concrete bridges were constructed in 1918, the roads have all been widened and re-surfaced and curves have been reduced, making easier and safer the approaches to the new bridges.

On the property at the corner of Spring and Putnam streets, opposite the Drink Hall, has been constructed a small pavilion in which will be served for a charge Lincoln spring water from the pipe line, which passes near this point. This lot will be graded, walks laid out, and shrubbery planted, adding much to the attractiveness of the State's property adjoining Congress Park.

At the High Rock Park a similar pavilion has been erected near the Peerless spring, for serving that very popular water. Both of these pavilions were constructed during the fall of 1919 and are ready for use next season.

About the Washington baths and the new heating plant a vast amount of filling, grading and planting has been done, with a view to bringing this property into the complete park scheme already begun about the Lincoln baths. When finished, this tract will be one of the most beautiful parts of the Reservation, with its walks and drives and shrub-dotted lawns completely surrounding the group of buildings.

SUMMARY OF LEGISLATIVE RECOMMENDATIONS

SUMMARY OF LEGISLATIVE RECOMMENDATIONS

A summary follows of the more important recommendations requiring legislative action. Certain of these recommendations are not discussed in the body of this report, because they were fully covered in the report of a year ago, but have not yet been enacted into law. Other minor recommendations are suggested in the body of the report, or will be made to the Legislature at proper times.

GENERAL

The importance of conserving the quality of waters, a phase of conservation that has heretofore received very inadequate attention, should now be given careful consideration by the Legislature, and laws should be enacted to provide as follows:

A. To give the Commission authority to establish standards of purity of all public waters, and discretionary power to prohibit the discharge of injurious waste matters or refuse into public waters until suitable treatment, which will maintain the standard of purity of the waters, has been applied to such waste matters or refuse.

B. To define and limit the jurisdiction of the Conservation Commission over the maintenance of standards of purity of waters and the protection of public water supplies, and the protection of fish, shellfish and other aquatic life in the waters of the State from pollution, without depending on the jurisdiction of other departments and commissions.

An appropriation of $10,000 is requested for continuing the work of the Commission upon the effects of pollution, and for further developing the work of conserving the quality and purity of public waters.

DIVISION OF FISH AND GAME

The deer law should be amended so as to permit the killing of bucks only, with a limit of one buck to a hunter. The season should also be shortened by cutting off the first two weeks in

October, when the leaves are still on the trees, in order to minimize the accidental shooting of does, and to increase the safety of hunters. The law should also contain a provision that deer may be transported only when the head is attached to the carcass in order to prevent bringing out of the meat of does in pack baskets. It is also recommended that the untanned hide of any deer shall not be dressed, trimmed or cut in such a manner as to destroy evidence of sex, except in the actual process of tanning.

It is recommended that the hunting license fee be increased to $1.25, in order that town and county clerks may be better compensated for their work in issuing these licenses.

It is recommended that a law be passed making it illegal to possess the plumage of protected birds.

Provision should be made for the establishment of a marine fish hatchery for the propagation of those food fishes of the sea that will respond to artificial propagation, in order that their numbers may be increased in New York State waters.

Jurisdiction of the Conservation Commission should be extended to all of the State's tidal waters, and laws should be passed placing size limits and closed seasons on certain fish and giving the Commission regulatory power over nets.

Hatchery employees should be placed upon a monthly salary basis, instead of the present per diem basis, and provision should be made for promotion and increased salary as a result of efficiency in fish cultural work.

The closed season on black bass should be extended to July first, in order to more nearly cover their entire spawning season.

Legislation should be enacted making fish planting in both public and private waters subject to regulation and control by the Commission.

The Commission should be empowered to sell fish at cost for stocking private waters and to furnish without charge sufficient fish for the initial stocking of farm fish ponds.

An amendment should be made to Section 182, Subdivision 5, of the Private Posting Law, so that the owners of fishing rights shall not be entitled to exemplary damages unless they annually stock the portions of streams posted by them.

An appropriation is requested for the purpose of providing uniforms for the game protective force, both for the purpose of improving their efficiency, and also because this assistance will be in the nature of a necessary salary increase.

A special appropriation and legislation is requested to enable the Commission to go very exhaustively into the causes of the decline of the oyster industry and the measures necessary to place it again upon a secure basis.

An appropriation is requested to enable the Commission to employ a field naturalist or biologist to keep a running check upon the wild life over which the Commission has supervision, to investigate the causes for its decrease, and to suggest measures for its increase.

A short open season on beaver is recommended, in order that a more effective check may be maintained on these animals in sections where they are causing considerable damage.

DIVISION OF LANDS AND FORESTS

Appropriations are requested for more surveying parties for the Forest Preserve, in order that old boundaries may be established before the original marks are lost.

An appropriation is requested for constructing and marking fire lines, trails, and shelters in the Forest Preserve, as an aid in fighting fires and as a convenience to the greatly increased numbers of vacationists.

Provision should be made for continuing the work of protecting the shore line of the Lake George islands, and for constructing docks, fire places, and other facilities for vacationists.

Provision should be made for a new pavilion at Long Point, a new dock at Burnham's Point, and for other repairs and betterments in the St. Lawrence Reservation.

Provision should be made for steel towers on the few remaining mountain stations where they have not been erected, and for the building or repair of the observers' cabins on several of the mountains.

Adequate appropriation should be made for energetically continuing the campaign against white pine blister rust as a safeguard for the entire future of the white pine industry in New York State.

Provision should be made for extending to all parts of the State the work of the Conservation Commission in forest protection and development.

DIVISION OF WATERS

The State's policy regarding stream control and the development of water power should be crystallized by appropriate legislation and further legislation should be enacted to make the power policy effective. As a first step, it is suggested that legislation be enacted to make effective those details of water power policy upon which there is not serious disagreement.

Legislation is recommended to empower the Commission, in case of an emergency, to authorize the temporary use of additional water supply by municipalities or water companies.

Legislation is recommended to make effective provisions of Article 7, Section 7 of the Constitution, allowing the construction on State Forest Preserve land of reservoirs for the supply of water to communities.

DIVISION OF SARATOGA SPRINGS

An appropriation is requested with which to begin a further development of the State Reservation at Saratoga Springs by the erection of a suitable bath house and other buildings.

CONSERVATION BUREAU
OF
ATTORNEY-GENERAL'S OFFICE

CONSERVATION BUREAU

OF

ATTORNEY-GENERAL'S OFFICE

Charles D. Newton	*Attorney-General*
Adelbert F. Jenks	*Deputy Attorney-General* *In Charge of Conservation Bureau*
E. J. Lake	*Deputy Attorney-General*
Eugene E. Howe	*Deputy Attorney-General*
P. J. Finn	*Deputy Attorney-General*
W. T. Moore	*Assistant Deputy Attorney-General*
J. O. Bates	*Assistant Deputy Attorney-General*

REPORT OF CONSERVATION BUREAU

OF THE

ATTORNEY-GENERAL'S OFFICE

PROCEEDINGS IN APPELLATE COURTS

People v. *Levi B. Dedrick.* Action was commenced against Mr. Dedrick to determine conflicting claims to a parcel of land in Great Lot 2, Kayaderosseras Patent, Saratoga County. The trial justice decided that title was in the State and the Appellate Division affirmed this judgment. The defendant appealed to the Court of Appeals and in November 1919 the appeal was dismissed, with costs.

People v. *Clarence L. Fisher and Florence Fisher Jackson.* An appeal to the Appellate Division by the defendants from a judgment of the Supreme Court whereby the State was adjudged the owner of lands in Herkimer County, acquired through a proceeding taken by the Forest Purchasing Board, resulted in a reversal and a dismissal of the complaint with costs. In the opinion by Hubbs, J. it is stated that the appropriation of the lands in question was undertaken without jurisdiction and was defective because of the failure of the Governor to officially consent to the appropriation.

Saratoga State Waters Corporation v. *George D. Pratt.* A decision has not been rendered by the Court of Appeals in this matter. The appeal was taken from a judgment of the Appellate Division, which said judgment reversed the judgment of the Supreme Court in favor of the plaintiff. This action was instituted for the purpose of compelling the specific performance of a certain agreement, and to enjoin the defendant from interfering with the plaintiff's possession of the property covered by such agreement and its operation of the springs located thereon.

Herkimer Lumber Company v. *State of New York.* The State has appealed to the Appellate Division from the judgment of the Court of Claims and from various orders. The claim was for $73,017.06 with interest for restraining claimant from lumbering operations. The award was for $72,924.98 with interest from

January 19, 1911, to January 15, 1919, or $34,955.37, making the total award $107,880.35

Taggarts Paper Company v. *State of New York.* The claimant herein appealed to the Court of Appeals from a judgment of affirmance in the Appellate Division. The claimant is now seeking interest from the date of the appropriation by the State.

People v. *George A. Stevens, Spencer G. Prime and John F. O'Brien.* This is an appeal by leave of the Appellate Division from an order of affirmance of said Appellate Division which affirmed an order of the Supreme Court vacating a judgment. The original action was in ejectment and the defendants were adjudged seized of a parcel of land in Essex County. The judgment was vacated in 1916. The Appellate Division has certified to the Court of Appeals certain questions to be reviewed.

People v. *Jennie H. Ladew and Joseph H. Ladew.* Appeal is pending to the Appellate Division from a judgment in favor of the People in an ejectment action involving title to premises located in Township 40, Hamilton County.

Orville Smith v. *Daniel Miller.* An action for damages for trespass was commenced against the defendant, an employee of the State. The appeal to the Court of Appeals is from a judgment of affirmance in the Appellate Division in favor of the plaintiff.

People v. *Lowell Fish et al.* Judgment was entered in favor of the People in an ejectment action. The lands are located in Township 15, Hamilton County. The defendants have appealed from the judgment.

People v. *Rawson L. Hayes and Annie M. Hayes.* The People appealed from a judgment in favor of the defendants. The action involved title to lands in Township 11, Old Military Tract, Essex County. Appeal dismissed.

People v. *George H. Carlin.* This is an appeal by defendant to to the Appellate Division from an order permitting the plaintiff to issue execution in an ejectment action. This relates to Township 40, Hamilton County.

People v. *Edward Oaklief.* Penalty action for fish and game violation. The appeal to the Appellate Division by the People was from a judgment in favor of the defendant. The appeal has been discontinued.

People v. *Leroy T. Bradford.* This was an action commenced to recover a penalty for refusing to show a hunting license. The trial court decided in favor of the plaintiff. The Appellate Division reversed the judgment and the Court of Appeals affirmed the judgment of the Appellate Division.

PROCEEDINGS PENDING IN COURT OF CLAIMS

Claims for appropriation of property at Saratoga Springs are as follows:

Catherine Driscoll et al v. *State;* claim for $30,510.00 with interest.

Amelia J. Cook v. *State;* claim for damages amounting to $50,700.00 with interest. Trial commenced October 1919.

Israel Lietzky v. *State;* claim for $15,000 with interest.

Arondack Spring Co. v. *State;* claim for $7,500 with interest.

William C. McQueen v. *State;* claim for $4,067.00 with interest.

DeWitt C. Stephens v. *State.* Claim filed May 22, 1914. Claim for $146,159.90. This includes claims for work done and for increased cost and expense of work occasioned by acts of agents of the state in connection with the Canaseraga Creek Improvement.

Titus B. Meigs and Ferris J. Meigs v. *State.* Claim filed to recover $11,530.00 for the appropriation of 130 acres of land in Township 5, John Brown's Tract, Herkimer County. This grows out of the construction of the Stillwater Reservoir on Beaver River. Claim filed 1907.

Saratoga State Waters Corporation v. *State.* Claim filed April 15, 1919, for the permanent appropriation of the mineral springs, buildings and property by the State at the Saratoga Reservation.

MISCELLANEOUS MATTER

Of the one hundred and ninety-two matters involving title and trespass in the Forest Preserve, transmitted to the Attorney-General for attention, there are one hundred and eight actions now pending. Twelve actions involving title were closed during the year 1919. There are seventy-two matters where actions have not been commenced. Fifteen actions are pending involving violations of the fish and game provisions of the Conservation Law; ten have been closed during the past year and there are ten awaiting adjustment by settlement or otherwise.

In the matter of Township 40, Hamilton County, where actions were commenced against the occupants of lands on Raquette Lake; the defendants in various actions now pending have made motions to serve supplemental answers, alleging title acquired through recently discovered evidence. This matter is being thoroughly investigated.

Under a deed of conveyance by which lands were attempted to be conveyed to the State by the Indian River Company, it was agreed that on failure of title to any of the lands conveyed, a refund should be made to the State. Title failed to a total of 7,817.35 acres. Action was commenced in September 1919 and an offer of judgment for $10,402.36 was accepted by written notice, and judgment was entered against the Indian River Company upon payment of the above amount.

Action has been commenced against the Adirondack League Club and the Gould Paper Company to determine title to the so-called Gore between Nobleboro Patent and the Moose River Tract, Herkimer County.

From the erection of a dam and subsequently an appropriation of land to enlarge the reservoir on Beaver River, in Township 5, John Brown's Tract, Herkimer County, three actions are pending. An effort has been made by defendants to secure legislation whereby these matters might be heard in the Court of Claims; but for two years the bill has been vetoed by the Governor.

FINANCIAL STATEMENT

FINANCIAL STATEMENT

SUMMARY OF RECEIPTS AND DISBURSEMENTS, EXCLUSIVE OF REGULAR ACCOUNTS WITH THE STATE COMPTROLLER, FOR FISCAL YEAR ENDING JUNE 30, 1919

Receipts

Fines and penalties	$63,981 95
Net license	26,064 57
Breeder's license	921 00
Hunting and angling licenses	256,724 12
Dog license	1,235 00
Tax and rentals shellfish lands	28,761 13
Foreign game tags	706 35
Tagging trout	1,896 00
Importation and possession license	744 00
Cuba reservoir rentals	2,776 00
Trespass on State lands	1,535 08
Sale of trees	4,851 13
Fire rebate	2,686 10
Top lopping	1,545 00
Telephone rentals	67 56
Refund on payroll	31 28
Fire fine	1,006 28
Miscellaneous	2,379 25
TOTAL	$397,911 80

Disbursements

By checks to State Treasurer	$397,789 30
By cost of collection	122 50
	$397,911 80

DISBURSEMENTS

(Exclusive of Division of Saratoga Springs)

Administration

Salaries, regular	$51,908 56	
Wages, regular	1,545 00	
Salaries, temporary	1,831 15	
Fuel, light, heat and power	109 90	
Printing, general	5,997 76	
Printing, Departmental Reports	1,478 56	
Publication of maps	934 49	
Advertising	445 63	
Equipment and supplies	9,583 99	
Materials	7 13	
Traveling	4,092 57	
Communication	7,612 73	
General plant service	576 40	
Rent	190 16	
Repairs	1,166 14	
		$87,480 17

Divison of Fish and Game

Game Protection

Salaries, regular	$180,166 21	
Wages, regular	900 00	
Wages, temporary	9,076 50	
Printing	12,472 13	
Protectors' expenses, traveling, etc.	88,909 40	
Postage, telephone, telegraph, etc.	7,183 93	
Equipment and supplies (hunters' buttons, etc.)	10,596 40	
Expenses of prosecution	3,434 19	
Rent	2,846 86	
Expenses of boats and launches.	7,679 57	
Harry D. Williams, services for years 1907–1908 and 1909	2,096 18	
		$325,361 37

Fish Culture

Salaries, regular	$20,300 00
Wages, temporary	45,225 17
Services, fish propagation in canals	1,610 81
Maintenance and operation of hatcheries	52,598 48
Installation of lighting system, Saranac Inn hatchery	914 49
Installation of lighting system, Caledonia hatchery	551 02
Chautauqua hatchery repairs	252 59
Repairs to fish car	1,517 91
Dunkirk fish hatchery construction	13,537 25
Dunkirk fish hatchery, equipment	3,348 93

Fish propagation in canals, materials	$2,279 00		
Improving fish ponds	56 48		
Construction and installation of glass tanks, Rochester Exposition Building	1,989 74		
		$144,181 87	
Marine Bureau			
Salaries, regular	$9,900 00		
Rent	3,500 00		
Maintenance and operation	1,422 20		
		14,822 20	
Game Farms			
Salaries, regular	$11,369 27		
Wages, temporary	1,995 91		
Maintenance and operation	18,710 96		
		32,076 14	
			$516,441 58

Division of Lands and Forest

Salaries, regular	$37,111 18		
Wages, temporary, reforesting, etc.	46,998 18		
Expenses, traveling; printing, equipment, supplies, etc.	19,937 40		
		$104,046 76	
State Forest Preserve Fund			
Purchase of land	$402,604 96		
Services and expenses	71,536 35		
		474,141 31	
Fire Fighting and Protection			
Salaries, regular	$3,120 00		
Salaries, rangers and observers.	66,012 28		
Wages, temporary	6,193 56		
Expenses, traveling; erection of observation towers, supplies, etc.	37,634 37		
		112,960 21	
Preserving shores of Lake George islands		4,939 32	
Repairs to docks, shorings and pavilions, St. Lawrence reservation		1,791 51	
Repairs to highways St. Lawrence reservation		52 12	
Repairing and construction of spillway, Cuba Lake reservoir		4,731 66	
Comstock prison refund		983 24	
W. F. White refund		540 00	
White pine blister rust, services and expenses of agents and employees, and payment of indemnities		26,094 81	
			730,280 94

Division of Waters

Salaries, regular	$24,217 90
Wages, regular	500 00
Salaries, temporary	4,383 50

Expenses, traveling; supplies, equipment, etc.	$4,394 91		
River regulation by storage reservoir, services and expenses	1,615 62		
		$35,111 93	
Bureau of Docks and Dams			
Salaries, regular	$3,500 00		
Wages, temporary	887 00		
Expenses, traveling; equipment, supplies, etc	3,289 00		
		7,676 00	
Hydrographic Investigations			
Salaries, temporary	$5,753 22		
Expenses, traveling; supplies, etc.	1,858 64		
		7,611 86	
			$50,399 79
Total expenditures, exclusive of Division of Saratoga Springs and Canaseraga Creek Improvement Funds			$1,384,602 48

Canaseraga Creek Improvement

Paid from Chapter 492, 1919

Maintenance and improvement	$367 51	
Expenses of litigation	536 50	
Payment of Certificate No. 10	11,068 75	
Payment of interest on Certificates Nos. 10 and 11	406 65	
Payment of Certificate No. 11	6,220 47	
Payment of bond	5,000 00	
Payment of interest on bonds	4,500 00	
		$28,099 88
Total expenditures, exclusive of Division of Saratoga Springs		$1,412,702 36

CANASERAGA CREEK IMPROVEMENT FUND

Receipts

By balance, National Commercial Bank, Albany, N. Y., July 1, 1918.			$4,265 32
1918			
Sept.	30.	Interest on deposits	27 96
Dec.	30.	Sale of Certificate No. 11	6,220 47
Dec.	31.	Interest on deposit	16 74

1919				
May	29.	Interest on deposit.....	$9 06	
	22.	Sale of Certificate No. 14	986 70	
June	30.	Interest on deposit.....	1 46	
				$11,527 71

Expenditures

July 1, 1918, to July 1, 1919. Paid for services and expenses of construction and maintenance			$5,201 31	
1918				
Dec.	31.	Interest on bonds	4,500 00	
Dec.	31.	Interest on Certificates Nos. 1, 2, 5 and 7...	1,293 75	
Dec.	31.	Interest on Certificate No. 3	150 00	
Dec.	31.	Interest on Certificate No. 10	298 22	
				$11,443 28

Cash balance, National Commercial Bank, Albany, N. Y., June 30, 1919......................	$84 43

DIVISION OF SARATOGA SPRINGS

INCOME-PRODUCING DEPARTMENTS

Cost of Operation

Geyser Bottling Works		
Fuel, light, power and water.....	$1,510 73	
Supplies and returns............	10,173 60	
Repairs	668 08	
Wages	6,204 67	
		$18,557 08
Ferndell Bottling Works		
Fuel, light, power and water.....	$289 43	
Supplies and returns	83,158 16	
Repairs	547 70	
Wages	4,145 69	
		88,140 98

Packing and Shipping Department		
Supplies	$2,880 66	
Wages	1,511 74	
		$4,392 40
Hathorn Drink Hall		
Supplies	$1,440 35	
Repairs	568 87	
Wages	3,702 69	
		5,711 91
Lincoln Baths		
Fuel, light, etc	$912 88	
Supplies	647 00	
Repairs	372 36	
Wages	3,440 63	
Bus operation	614 22	
		5,987 09
Saratoga Baths		
Fuel, light, etc	$2,866 74	
Supplies	951 53	
Repairs	904 65	
Wages	8,412 17	
		13,135 09
Laundry		
Supplies	$212 44	
Repairs	33 80	
Wages	1,062 13	
		1,308 37
Pumping System		
Fuel, light, etc	$313 01	
		313 01
Cup Service		
Supplies	$1,080 97	
Repairs	4 53	
Wages	965 15	
		2,050 65
Gas Plant Expense		101 69
Patterson Building Expense		393 43
Other Buildings, Water Rents		23 00

Repair Crew

Supplies	$1,482 28	
Wages	181 00	
		$1,663 28

Paint Shop

Supplies	$289 29	
Repairs	3 00	
Wages	453 73	
		746 02

Trucking

Supplies	$753 25	
Repairs	621 53	
Wages	1,258 21	
		2,632 99

Office and General Expenses

Fuel, light, etc	$771 91	
Supplies	149 56	
Travel and communication	359 32	
Salaries	3,463 75	
Freight and express on sales	7,349 28	
Discounts	413 39	
		12,507 21
Total costs of operation for all income producing departments		$157,664 20

Income Accounts

Ferndell sales	$91,444 20
Sales of coolers	62 30
Mineral water sales	25,351 85
Drink hall admittance and sales	7,840 35
Lincoln baths receipts	11,171 12
Saratoga baths receipts	14,420 96
Cup sales	2,462 90
Gas sales	433 88
Interest	617 42
Rentals	9,395 77

Sales of scrap metal, junk, etc.	$2,152 53	
Increase in bottled water, inventory	463 42	
		$165,816 70
Net profits, income producing departments		$8,152 50

SARATOGA DEPARTMENTS NOT PRODUCING INCOME

Disbursements

Administrative		
Personal Service		
Parks and roads	$7,018 31	
Well department	2,939 11	
Engineering department	2,416 24	
Laboratory	2,422 94	
Superintendent's office	10,244 09	
		$25,040 69
General Maintenance		
Parks and roads	$2,677 29	
Well department	422 12	
Fuel, light, etc.	2,180 01	
Supplies	1,033 19	
Repairs	185 03	
Publicity and advertising	3,046 74	
Travel	816 68	
Communication	628 70	
General plant service	454 22	
Maintenance of horse	583 00	
Upkeep of Dodge car	581 91	
		12,608 89
		$37,649 58
Equipment purchased		$17,494 53
Extra		
Extraordinary repairs and replacements		
Spring water department	$2,406 80	
Baths department	3,968 03	
General administration	2,358 60	
		$8,733 43

Experimental work		$101 00
Albany office salaries		1,320 00
Depreciation (removal of these structures)		
High Rock baths	$1,000 00	
Woodcraft building	8,000 00	
Minnonebe pipe line	200 00	
		9,200 00
Depreciation on sale of horse, wagons, etc		87 04
Expended to July 1, 1919, on Washington bath house	$97,965 81	
Expended to July 1, 1919, on New power house	12,769 24	
		110,735 05
Old accounts paid (Windolph)		1,105 91
		$131,282 43

Administrative	$25,040 69
Maintenance	12,608 89
Extraordinary	131,282 43
Equipment purchased	17,494 53
Total cost of operation of departments not productive of income	$186,426 54

Respectfully submitted,

George D. Pratt,
Commissioner.

January 15, 1920.

DIVISION OF FISH AND GAME

SUPPLEMENTARY STATISTICS

1919

HUNTING AND TRAPPING LICENSES

TOTAL NUMBER SOLD FROM JULY 1, 1919 TO JUNE 30, 1920

	Res.	Non-Res.	Total
Albany	$5,026.80	$390	$5,416.80
Allegany	3,711.10	120	3,831.10
Bronx	516.00	50	566.00
Broome	4,973.50	730	5,703.50
Cattaraugus	5,402.00	880	6,282.00
Cayuga	3,610.95	310	3,920.95
Chautauqua	4,718.65	530	5,248.65
Chemung	3,421.70	30	3,451.70
Chenango	3,285.30	150	3,435.30
Clinton	2,982.00	250	3,232.00
Columbia	3,122.20	420	3,542.20
Cortland	2,122.00	170	2,292.00
Delaware	3,468.00	140	3,608.00
Dutchess	5,152.85	650	5,802.85
Erie	12,203.00	830	13,033.00
Essex	4,678.00	710	5,388.00
Franklin	4,893.00	1,670	6,563.00
Fulton	3,649.50	380	4,029.50
Genesee	2,748.35	430	3,178.35
Greene	2,822.85	160	2,982.85
Hamilton	1,756.00	900	2,656.00
Herkimer	4,732.00	1,190	5,922.00
Jefferson	6,553.10	810	7,363.10
Kings	2,919.75	750	3,669.75
Lewis	2,804.00	290	3,094.00
Livingston	3,131.20	360	3,491.20
Madison	2,915.00	90	3,005.00
Monroe	8,104.00	690	8,794.00
Montgomery	3,235.45	210	3,445.45
Nassau	4,174.00	250	4,424.00
New York	6,426.40	4,460	10,886.40
Niagara	3,463.00	280	3,743.00
Oneida	8,375.00	2,320	10,695.00
Onondaga	9,546.10	890	10,436.10
Ontario	3,607.45	130	3,737.45
Orange	8,133.30	860	8,993.30
Orleans	1,452.50	70	1,522.50
Oswego	4,676.00	350	5,026.00
Otsego	3,787.00	80	3,867.00
Putnam	896.25	250	1,146.25
Queens	1,841.00	230	2,071.00
Rensselaer	3,956.00	340	4,296.00
Richmond	835.00	90	925.00
Rockland	2,171.20	420	2,591.20
St. Lawrence	7,861.05	1,300	9,161.05
Saratoga	4,758.00	520	5,278.00
Schenectady	3,780.00	520	4,300.00
Schoharie	2,009.00	10	2,019.00
Schuyler	1,280.00	130	1,410.00
Seneca	1,767.40	130	1,897.40
Steuben	6,402.00	250	6,652.00
Suffolk	7,951.75	1,060	9,011.75
Sullivan	3,244.00	400	3,644.00
Tioga	1,877.95	350	2,227.95
Tompkins	2,645.00	100	2,745.00
Ulster	5,664.05	330	5,994.05
Warren	3,592.20	340	3,932.20

Hunting and Trapping Licenses — (*Concluded*)

	Res.	Non-Nes.	Total
Washington	$3,127.60	$440	$3,567.60
Wayne	3,804.40	120	3,924.40
Westchester	5,468.70	590	6,058.70
Wyoming	2,244.10	100	2,344.10
Yates	1,655.10	....	1,655.10
	$251,130.75	$32,000	$283,130.75

GAME PROTECTORS' SHOOTING COMPETITION

INDIVIDUAL RECORDS

Position	Protector	Division	Score
1.	*Underhill, C. E.	Southern Adirondack	604
2.	*Cameron, Byron A.	Northern Adirondack	563
3.	Masten, Clayton H.	Southern Adirondack	548
4.	Hazelton, Miles R.	Southern Adirondack	545
5.	Waterhouse, W. L.	St. Lawrence	537
6.	Bacon, Ralph E.	Allegany	535
7.	Dexter, Burr T.	Southern Adirondack	521
8.	Abrams, A. C.	Southern Adirondack	514
9.	Barry, Joseph	Hudson	510
10.	*Weston, Wm. H.	Central New York	509
11.	Arnold, A. H.	Hudson	498
12.	Ganey, E. R.	Western	494
13.	Witherall, R. L.	Western	492
14.	Pike, John S.	Allegany	488
15.	Winslow, Alvin	Eastern Adirondack	480

MEDAL WINNERS

1. Masten, Clayton H.
2. Hazelton, Miles R.
3. Waterhouse, Wm. L.

DIVISION RECORDS

Position	Division	Protectors	Scores	
			Total	Average
1.	Southern Adirondack	9	4,140	460.0
2.	Allegany	12	4,234	352.8
3.	Western	12	4,124	343.7
4.	St. Lawrence	10	3,372	337.2
5.	Eastern Adirondack	12	3,799	316.6
6.	Northern Adirondack	9	2,821	313.4
7.	Hudson	11	3,398	308.9
8.	Central New York	11	3,157	287.0
9.	Eastern	7	1,605	229.3
10.	Southern	12	1,910	159.2
11.	Ontario	9	1,307	145.2
12.	Metropolitan and Long Island	14	1,867	133.4
		128	35,734	....
	Average per Protector for the year			279.3

CUP WINNER, HIGHEST AVERAGE

Southern Adirondack, Claude E. Underhill, Inspector.

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* Inspectors not eligible to compete for medals.

COMPARISONS

First month's scores compared with last month's scores.

DIVISION	July, 1917	June, 1919	Gain
1. Southern Adirondack	10.14	40.60	30.44
2. Allegany	7.62	32.00	26.78
3. Western	10.45	30.20	21.55
4. St. Lawrence	14.25	35.70	21.45
5. Eastern Adirondack	7.91	24.80	16.89
6. Northern Adirondack	10.50	30.20	19.70
7. Hudson	7.40	24.50	17.10
8. Central New York	6.50	25.20	18.70
9. Eastern	3.75	13.20	9.45
10. Southern	5.00	13.30	8.30
11. Ontario	8.57	16.10	7.53
12. Metropolitan and Long Island	4.08	11.40	7.32
Individual average 1917–18			176
Individual average 1918–19			279.3
Gain			103.3

FIRST YEAR'S DIVISION SHOOT COMPARED WITH LAST YEAR'S DIVISION YEARLY AVERAGE SCORE

DIVISION	1917–1918	1918–1919	Gain
1. Southern Adirondack	259	460	201
2. Allegany	181	352.8	171.8
3. Western	203	343.7	140.7
4. St. Lawrence	212	337 2	125.2
5. Eastern Adirondack	215	316.6	101.6
6. Northern Adirondack	213	313.4	100.4
7. Hudson	195	308.9	113.9
8. Central New York	178	287	109
9. Eastern	153	229.3	76.3
10. Southern	111	159.2	48.2
11. Ontario	116	145.2	29.2
12. Metropolitan and Long Island	108	133.4	25.4

BUREAU OF INLAND FISHERIES

RETURNS OF LICENSED FISHERMEN

Pounds of Fish Reported Caught During the Year 1918

	Tibbitts Lt., Chaumont bay, etc.	Hudson river, etc.	Lake Erie	Lake Ontario	Seneca river, Seneca and Cayuga lakes
Bass (stripped)	....	9,449	....	....	....
Bass (rock)	3,785	....	....	....	....
Bass (strawberry)	....	....	....	....	....
Bullheads	47,361	31,902	1,065	1,676	8,795
Carp	5,447	297,392	30,865	216	64,597
Catfish	....	....	....	....	....
Ciscoes	17,473	....	3,313,442	205,763	....
Dogfish	....	....	....	....	....
Eels	35,226	182,052	....	2,955	500
Frostfish (tomcod)	....	7,526	....	....	....
Herring	....	88,224	....	....	....
Lake trout	2,222	....	20,756	21,971	....
Mullet	....	....	....	....	....
Perch	45,970	22,179	21,450	3,456	....
Pickerel	22,087	797	200	977	....
Pike (blue)	14,305	....	74,869	49,517	....
Pike (wall)	26,022	140	5,700	10,576	....
Shad	....	228,378	....	....	....
Sturgeon	858	22,015	8,425	11,813	....
Suckers	104,152	134,311	46,535	20,433	13,170
Sunfish	10,272	3,369	8,000	625	9,850
Whitefish	4,150	....	158,845	101,112	....
Billfish	....	....	....	....	....
Ling	5,003	....	9,320	33,808	....
Total pounds	344,333	1,009,734	3,699,472	464,898	98,562
Total value	$38,476 61	$100,833 69	$243,748 98	$53,261 00	$8,199 65

RETURNS OF LICENSED FISHERMEN

Pounds of Fish Reported Caught During the Year 1918— (*Continued*)

	Sodus, Fair Haven bays, etc.	Niagara river	Sandy pond	Sturgeon lines, St. Lawrence river
Bass (stripped)	....	....	....	....
Bass (rock)	....	....	....	....
Bass (strawberry)	....	....	890	....
Bullheads	20,682	2,245	23,280	20
Carp	4,740	8,686	65	....
Catfish	....	....	....	....
Ciscoes	216,537	21,060	20	....
Dogfish	4,293	....	1,985	....
Eels	6,191	1,640	865	870
Frostfish (tomcod)	....	....	....	....
Herring	....	....	....	....
Lake trout	....	....	....	....
Mullet	....	....	....	....
Perch	43,513	1,270	....	....
Pickerel	....	....	....	....
Pike (blue)	....	12,650	....	....
Pike (wall)	....	....	....	....
Shad	....	....	....	....
Sturgeon	....	14,480	....	15,600
Suckers	5,187	17,993	900	10
Sunfish	26,494	....	30,525	....
Whitefish	....	....	....	....
Billfish	....	....	400	....
Ling	....	....	....	....
Total pounds	327,637	80,024	58,930	16,500
Total value	$29,567 21	$9,373 50	$40,079 68	$3,958 25

RETURNS OF LICENSED FISHERMEN

(Pounds of Fish Reported Caught During the Year 1918 — *Continued*)

	4,250* set-lines	Eel weirs	Other waters deleterious	Minnows	Wire traps
Bass (stripped)					
Bass (rock)			1,865		117
Bass (strawberry)			50		
Bullheads			46,959		399
Carp			90,193		191
Catfish					
Ciscoes			200		
Dogfish			10,349		
Eels		32,612	8,909		58
Frostfish (tomcod)					
Herring					
Lake trout					
Mullet					
Perch			4,060		1,973
Pickerel					
Pike (blue)					
Pike (wall eyed)					
Shad					
Sturgeon					
Suckers			63,234		2,171
Sunfish			18,198		342
Whitefish					
Billfish					
Ling					
Total pounds		32,612	244,017		5,251
Total value	$21,250 00	$4,502 65	$24,241 65	$17,844	$569 45

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* Average $5.

Total pounds of fish taken	6,381,970
Total value of fish taken	$600,906 32

RECEIPTS OF THE BUREAU OF MARINE FISHERIES

FOR THE FISCAL YEAR FROM JULY 1, 1918 TO JUNE 30, 1919

Rentals	$18,810 55
Taxes	6,746 35
Tax penalties	82 02
License fees	2,930 00
Sanitary certificates	1,212 98
Recording fees	83 00
Relocation surveys	17 25
Miscellaneous	4 00
	$29,886 15
Imported and domestic game tags	706 25
Total receipts of bureau	$30,592 40

BUREAU OF FISH CULTURE

SUMMARY OF FISH DISTRIBUTION DURING THE YEAR 1919

Adirondack	6,923,203
Bath	1,086,046
Caledonia	39,192,677
Chautauqua	4,401,438
Cold Spring Harbor	303,035,400
Delaware	1,029,560
Fulton Chain	14,485,840
Linlithgo	20,932,650
Oneida	30,003,255
St. Lawrence	20,614,018
Warrensburg	934,900
Dunkirk	86,208,000
Canal ponds	100,768
	$528,947,755

DISTRIBUTION OF FISH BY STATION

January 1, 1919, to December 31, 1919

ADIRONDACK HATCHERY

Whitefish fry	5,015,000
Brook trout fry	503,000
Brook trout fingerlings	832,350
Brook trout adults	9
Lake trout fry	57,000
Lake trout fingerlings	323,850
Lake trout adults	3
L. L. Salmon fingerlings	82,000
Brown trout fingerlings	51,500
Rainbow trout fingerlings	58,491
	6,923,203

The brown trout were produced from eggs furnished by The Caledonia Station and the Rainbow Trout from eggs furnished by the Cold Spring Harbor Station.

Thirteen million, five hundred thousand yellow perch eggs were collected and sent to the Canal Ponds at Schuylerville.

BATH HATCHERY

Brook trout advanced fry	178,650
Brook trout fingerlings	587,126
Lake trout fingerlings	112,000
Brown trout fingerlings	136,270
Rainbow trout fingerlings	20,400
Steelhead trout fingerlings	51,600
	1,086,046

The brown trout were produced from eggs furnished by the Caledonia Station.

CALEDONIA HATCHERY

Smelt fry	5,000,000
Whitefish fry	2,200,000
Lake herring fry	20,770,000
Lake trout fry	550,000
Lake trout fingerlings	617,850

Brook trout advanced fry	303,000
Brook trout fingerlings	325,900
Brown trout advanced fry	36,000
Brown trout fingerlings	182,700
Brown trout adults	6
Rainbow trout fingerlings	140,800
Rainbow trout adults	6
Steelhead trout fingerlings	91,300
Pikeperch fry	8,925,000
Maskalonge fry	50,000
Smallmouth bass adults	77
Largemouth bass adults	38
	39,192,677

Thirty thousand one-inch brook trout were sent to the Linlithgo Station for further development and distribution.

One hundred and fifty thousand brown trout eggs were sent to the Bath Station, 150,000 to the Delaware Station and 75,000 to the Adirondack Station for development and distribution and 100,000 to the Willowemoc Hatchery in exchange for brook trout eggs.

The smelt were produced from eggs furnished by the Cold Spring Harbor Station, the maskalonge from eggs furnished by the Chautauqua Station, the pikeperch from eggs furnished by the Oneida and St. Lawrence Stations and the United States Bureau at Bay City, Mich., and the whitefish from eggs furnished by the United States Bureau at Cape Vincent.

CHAUTAUQUA HATCHERY

Brook trout fingerlings	349,725
Maskalonge fry	4,051,500
Bullhead adults	209
Largemouth bass adults	4
	4,401,438

Maskalonge eggs were sent to the Caledonia and St. Lawrence Stations for development and distribution.

Two hundred and twenty-two thousand maskalonge eggs were sent to the Pennsylvania Commission for exchange.

Two hundred and fifty thousand yellow perch eggs were sent to the Canal ponds at Schuylerville

COLD SPRING HARBOR HATCHERY

Brook trout fingerlings	151,750
Brown trout fingerlings	71,600
Rainbow trout fingerlings	52,050
Whitefish fry	300,000
Pikeperch fry	900,000
Smelt fry	126,204,000
Tomcod fry	118,000,000
Flatfish fry	37,000,000
Lobsters	20,356,000
	303,035,400

Smelt eggs were sent to the Caledonia, Fulton Chain and Linlithgo Stations for development and distribution.

Eighty-three thousand brown trout eggs, one-half eyed and one-half green, were sent to the Linlithgo Station for development and distribution.

Fifty thousand rainbow trout eggs were sent to the Adirondack Station and 55,000 to the Delaware Station for development and distribution.

The pikeperch were produced from eggs furnished by the Oneida Station.

The whitefish fry were received from the New York aquarium.

DELAWARE HATCHERY

Brook trout fry	445,000
Brook trout advanced fry	211,000
Brook trout fingerlings	224,350
Brown trout fry	36,000
Brown trout fingerlings	66,200
Brown trout adults	4
Rainbow trout fry	47,000
Rainbow trout adults	6
	1,029,560

The brown trout were produced from eggs furnished by the Caledonia Station and the rainbow trout from eggs furnished by the Cold Spring Harbor Station.

FULTON CHAIN HATCHERY

Smelt fry	2,138,000
Whitefish fry	11 500,000
Brook trout fry	131,000
Brook trout advanced fry	427,000
Brook trout fingerlings	102,333
Brook trout adults	9
Lake trout fry	76,000
Lake trout advanced fry	38,000

Lake trout adults	3
L. L. Salmon advanced fry	49,387
L. L. Salmon fingerlings	24,081
L. L. Salmon yearlings	27
	14,485,840

The smelt were produced from eggs furnished by the Cold Spring Harbor Station.

LINLITHGO HATCHERY

Smelt fry	8,544,000
Brook trout fingerlings	571,145
Brown trout fingerlings	42,250
Pikeperch fry	9,600,000
Shad fry	2,160,000
Long-eared sunfish fingerlings	15,000
Crappie fingerlings	250
Crappie adults	5
	20,932,650

The smelt were produced from eggs furnished by the Cold Spring Harbor Station, the pikeperch from eggs furnished by the Oneida Station and the brown trout from eggs furnished by the Cold Spring Harbor Station.

Thirty-thousand one-inch brook trout fingerlings were received from the Caledonia Station for further development and distribution.

Fifty-four quarts of yellow perch eggs were sent to the Canal ponds at Schuylerville and eighteen quarts to the New York aquarium.

ONEIDA HATCHERY

Pikeperch fry	29,600,000
Smallmouth bass fry	166,000
Smallmouth bass advanced fry	1,800
Smallmouth bass fingerlings	73,100
Yellow perch fingerlings	162,000
Miscellaneous fingerlings	300
Miscellaneous adults	55
	30,003,255

Three hundred quarts of pikeperch eggs were received from the United States Bureau Station at Bay City, Mich., from which were hatched 3,375,000 fry.

Thirty-five quarts of green pikeperch eggs and forty quarts of eyed eggs were sent to the Linlithgo Station, thirty quarts of eyed eggs to the Caledonia Station and six quarts of eyed eggs to the Cold Spring Harbor Station for development and distribution.

Fifty-three thousand smallmouth bass fry were sent to the Canal ponds at Fort Hunter and 80,000 to the Canal ponds at Schuylerville.

ST. LAWRENCE HATCHERY

Pikeperch fry	20,456,000
Maskalonge fry	150,000
Smallmouth bass fingerlings	8,018
	20,614,018

Twenty quarts of pikeperch eggs were sent to the Caledonia Station for development and distribution.

The maskalonge were produced from eggs furnished by the Chautauqua Station.

WARRENBURG HATCHERY

Brook trout fingerlings	920,900
L. L. salmon fingerlings	14,000
	934,900

DUNKIRK HATCHERY

Lake Herring fry	86,208,000

CANAL PONDS

Port Hunter:	
Smallmouth bass fingerlings	2,350
Yellow perch, fingerlings	......
Bullhead fingerlings	......
Schuylerville:	
Smallmouth bass fingerlings	300
Largemouth bass fingerlings	43,870
Bullhead fingerlings	48,500
Bullhead yearlings	5,748
	100,768

DIVISION OF LANDS AND FORESTS

SUPPLEMENTARY STATISTICS

1919

Forest Fires 1919

SUMMARY BY MONTHS AND COUNTIES

COUNTY	MONTH									
	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Totals
ADIRONDACKS										
Clinton	2	2	3	3	3	2	4	1	....	20
Essex	....	....	2	3	3	8	7	2	....	25
Franklin	....	1	1	2	7	5	15	....	....	31
Fulton	....	....	1	....	1	....	....	....	....	2
Hamilton	....	....	3	....	5	5	7	2	2	24
Herkimer	1	....	1	1	14	2	3	....	....	22
Lewis	....	....	2	1	8	....	4	1	....	16
Oneida	....	....	2	....	4	1	....	....	....	7
Saratoga	2	....	2	2	2	4	1	....	....	13
St. Lawrence	....	....	1	2	15	7	14	....	....	39
Warren	....	....	6	5	6	3	1	1	....	22
Washington	....	....	....	....	....	....	....	....	....	....
Total Adirondacks	5	3	24	19	68	37	56	7	2	221
CATSKILLS										
Delaware	....	5	1	2	....	....	....	....	1	9
Greene	....	....	4	1	....	....	....	....	1	6
Sullivan	....	2	1	2	....	1	....	....	....	6
Ulster	3	6	6	6	1	1	1	....	....	24
Total Catskills	3	13	12	11	1	2	1	....	2	45
TOTALS										
Adirondacks	5	3	24	19	68	37	56	7	2	221
Catskills	3	13	12	11	1	2	1	....	2	45
Grand totals	8	16	36	30	69	39	57	7	4	266

REFORESTATION

PRODUCTION OF NURSERIES — 1919

SPECIES	NAME OF NURSERY						Total
	Saratoga	Salamanca	Saranac Inn	Comstock	Central Islip	Goldsmith	
White pine, four-year transplants	310,325	221,550	59,000	973,750	109,100	1,202,000	2,875,725
White pine, three-year transplants	14,700	4,100	37,500	1,000	1,500		58,800
White pine, three-year seedlings	189,000	45,500		915,000			1,149,500
White pine, two-year seedlings			10,000				10,000
Scotch pine, four-year transplants	57,950	16,850	52,450	90,900	14,900		233,050
Scotch pine, three-year transplants	117,000	74,600	160,550	27,700	30,500		410,350
Scotch pine, three-year seedlings				534,000			534,000
Scotch pine, two-year seedlings	24,950	5,900	2,900				33,750
Norway spruce, four-year transplants	68,875	56,750	204,250	18,750	104,650		453,275
Norway spruce, three-year transplants	42,150	24,850	53,000	5,200	500		125,700
Norway spruce, three-year seedlings				548,000			548,000
Norway spruce, two-year seedlings	12,550	11,100	33,500	4,100			61,250
Red pine, four-year transplants	1,200	27,750	265,400		5,900		300,250
Red pine, three-year transplants	202,705	99,250	24,250	3,000	47,700		376,905
Red pine, two-year seedlings	1,200						1,200
White cedar, four-year transplants	13,300	3,600		14,050	2,000		32,960
White cedar, three-year transplants	28,625	11,700		41,600	5,050		86,975
White cedar, three-year seedlings	6,000	73,100					79,100
White cedar, two-year seedlings		1,200					1,200
European larch, seedlings	12,000	17,200	25,000				54,200
Black locust, seedlings	21,800	10,400		9,500	7,450		49,150
Carolina poplar, cuttings	6,000						6,000
White ash, seedlings	1,700	16,000		2,000			19,700
Basket willow, cuttings	1,000	3,900		2,000			6,900
Douglas fir, four-year transplants		7,500					7,500
Red pine, five-year transplants		750					750
Scotch pine, five-year transplants		500					500
Colorado blue spruce		16,200					16,200
Catalpa					75		75
	1,133,030	750,250	927,800	3,190,550	329,325	1,202,000	7,532,955

UTILIZATION OF NURSERY STOCK—1919

SPECIES	Sales to private owners	State institutions	PLANTED ON FOREST PRESERVE			Grand total
			Spring	Fall	Total	
White pine, four-year transplants	733,375	25,000	1,599,350	518,000	2,117,350	2,875,725
White pine, three-year transplants	58,800					58,800
White pine, three-year seedlings			1,149,500		1,149,500	1,149,500
White pine, two-year seedlings	10,000					10,000
Scotch pine, four-year transplants	227,550	2,300	3,200		3,200	233,050
Scotch pine, three-year transplants	195,850	2,500	4,000	208,000	212,000	410,350
Scotch pine, three-year seedlings				534,000	534,000	534,000
Scotch pine, two-year seedlings	33,750					33,750
Norway spruce, four-year transplants	281,875	9,000	162,400		162,400	453,275
Norway spruce, three-year transplants	122,700	3,000				125,700
Norway spruce, three-year seedlings			104,000	444,000	548,000	548,000
Norway spruce, two-year seedlings	61,250					61,250
Red pine, four-year transplants	58,650	2,500		239,100	239,100	300,250
Red pine, three-year transplants	340,355	12,550	24,000		24,000	376,905
Red pine, two-year seedlings	1,200					1,200
White cedar, four-year transplants	20,700	1,950	10,200	100	10,300	32,950
White cedar, three-year transplants	40,475	25,750	20,750		20,750	86,975
White cedar, three-year seedlings	2,100	1,000	76,000		76,000	79,100
White cedar, two-year seedlings	1,200					1,200
European larch, seedlings	10,700	1,000	42,500		42,500	54,200
Black locust, seedlings	40,650	8,500				49,150
Carolina poplar, cuttings	4,000	2,000				6,000
White ash, seedlings	12,200	7,500				19,700
Basket willow, cuttings	3,900	3,000				6,900
Douglas fir, four-year transplants	1,500		6,000		6,000	7,500
Red pine, five-year transplants	500	250				750
Scotch pine, five year transplants	500					500
Colorado blue spruce	1,200		15,000		15,000	16,200
Catalpa	75					75
	2,265,055	107,800	3,216,900	1,943,200	5,160,100	7,532,955

INVENTORY OF TREES IN NURSERIES NOVEMBER 10, 1919

SPECIES	NAME OF NURSERY							Total
	Saranac Inn	Comstock	Saratoga	Salamanca	Central Islip	Goldsmith	Indian Lake	
White pine, five-year transplants	....	....	....	....	28,600	....	....	28,600
White pine, four-year transplants	166,475	66,000	50,000	55,000	48,040	80,000	300,000	765,515
White pine, three-year transplants	....	....	50,000	....	....	....	....	50,000
White pine, one-year seedlings	264,000	1,365,000	240,000	....	....	....	....	1,869,000
Scotch pine, four-year transplants	....	19,000	....	....	....	....	....	19,000
Scotch pine, three-year transplants	111,125	225,000	259,000	375,000	....	....	....	970,125
Scotch pine, two-year seedlings	....	290,000	370,000	365,200	....	....	....	1,025,200
Norway spruce, four-year transplants	....	2,000	....	....	....	....	....	2,000
Norway spruce, three-year transplants	734,940	....	597,000	120,000	49,900	....	....	1,501,840
Norway spruce, three-year seedlings	240,000	....	....	....	....	....	....	240,000
Norway spruce, two-year seedlings	....	337,500	150,000	25,000	....	....	....	512,500
Norway spruce, one-year seedlings	186,000	172,400	90,000	....	....	....	....	448,400
Red pine, four-year transplants	652,400	....	....	205,400	5,450	....	....	863,250
White cedar, four-year transplants	....	8,600	....	200	15,300	....	....	24,100
White cedar, two-year seedlings	....	108,000	45,000	150,000	....	....	....	303,000
White cedar, one seedlings	....	103,500	72,000	....	....	....	....	175,500
White spruce, four-year transplants	....	....	....	400	....	....	....	400
White spruce, two-year seedlings	....	150,000	160,000	....	....	....	....	310,000
White spruce, one seedlings	175,000	....	108,000	....	....	....	....	283,000
Colorado blue spruce, four-year transplants	....	5,600	....	....	....	....	....	5,600
White ash, seedlings	....	....	5,000	2,000	....	....	....	7,000
Black locust, seedlings	....	450	26,000	....	....	....	....	26,450
Ailanthus, seedlings	....	13,200	....	....	....	....	....	13,200
Basswood, seedlings	....	....	....	300	....	....	....	300
	2,529,940	2,866,250	2,222,000	1,298,500	147,290	80,000	300,000	9,443,980

DIVISION OF WATERS

SUPPLEMENTARY STATISTICS

1919

Applications for Approval of Plans for Docks Received During the Year 1919

Serial Number	Location Number	Watershed	Location	Owner	Purpose	Approved
18	1385	Lower Hudson	Troy	Harbor Dock Commission	Docking	Order not required
19	150A	Long Island	Elm Point	Property Operating Corporation	Landing	Order not required
20	185BA	Lower Hudson	New Rochelle	City of New Rochelle	Docking	July 16, 1919
21	316	Long Island	Amityville	Town of Babylon	Docking	Order not required

Applications For Approval of Plans For Dams Received During the Year 1919

208	652	Oswego	Freeville	George A. Brewer	Power	Pending
289	345	Susquehanna	Whitney Point	Union Electric Company	Power	Pending
292	40	West Ontario	Waterport Station	Western New York Utilities Company	Power	Pending
293	263B	Lower Hudson	Nyack	Village of Nyack	Pleasure	Pending
294	456A	Black	Port Leyden	Electric Light & Power Co	Power	Pending
295	428	Champlain	Ausable Forks	J. & J. Rogers Company	Ice	Pending
319	327M	Lower Hudson	Sloatsburg	Ramapo Mts. Water, Power & Service Company, Inc	Water supply	Pending
320	327Q	Lower Hudson	Sloatsburg	Ramapo Mts. Water, Power & Service Company, Inc	Water supply	Pending
321	327S	Lower Hudson	Sloatsburg	Ramapo Mts. Water, Power & Service Company, Inc	Water supply	Pending
346	520	Genesee	Hunts	Erie Railroad Company	Water supply	Order not required
347	484	Genesee	Dansville	Carso Paper Company	Power	Order not required
348	399	Mohawk	Gloversville	Fulton County	Water supply	April 24, 1919
349	316	Delaware	White Sulphur Spgs	Henry Weiner	Boating	Order not required
350	375	Chemung	Tyrone	Tyrone Milling Co., Inc	Power	Order not required
351	194	Lower Hudson	Tuckahoe	Hodgman Rubber Company	Power	Order not required
352	421	Mohawk	Gloversville	C. E. Lair & Earl Bloss	Fish pond	Order not required
353	459	Oswego	Orleans	Village of Newark	Water supply	May 28, 1919
354	708	Erie	Westfield	Village of Westfield	Water supply	Order not required
355	727	Mohawk	Hinckley	Hinckley Fibre Company	Power	Order not required
356	504	Champlain	Lewis	L. S. Marshall	Power	Order not required
357	379	Lower Hudson	Peekskill	Lounsbury & Sons Company	Ice pond	June 10, 1919
358	242	Delaware	Hurleyville	George Van Keuren	Bathing	June 27, 1919
359	318	Oswego	Skaneateles	Glenside Woolen Mills Corp	Power	Order not required
360	128	Black	Black River	Northern New York Utilities Company	Power	July 30, 1919
361	228A	East Ontario	Chaumont	Heath Brothers	Power	Order not required
362	678	Black	Old Forge	Gould Paper Company	Log driving	Order not required
363	548	Black	Fulton Chain	Lyon de Camp	Pleasure	Aug. 15, 1919
364	210	Black	Copenhagen	B. J. Buchol	Power	Order not required
365	789	Upper Hudson	Indian Lake	Finch, Pruyn & Co., Inc	Storage	Order not required
366	453	Mohawk	Beaches Corners	E. H. Jones	Fish and ice pond	Order not required
367	838	Upper Hudson	Schroon River	Schroon Lake Lighting Corp	Power	Dec. 5, 1919
368	759	Lower Hudson	Dashville	United Hudson Electric Corp	Power	Nov. 10, 1919
369	596	Susquehanna	Sidney	Standard Heat, Light & Power Company	Power	Order not required
370	524	Champlain	Onchiota	L. H. Somers	Pleasure	Order not required

APPENDIX A

WATER SUPPLY AND SEWERAGE

WATER SUPPLY AND SEWERAGE

During the war period, high prices of labor, material and money, together with governmental restrictions on the use of all of these for municipal purposes, caused nearly complete cessation of waterworks construction in the State. No signs of recovery from this condition are yet apparent and this recovery can hardly be hoped for before next spring at the earliest.

It would seem that the natural growth of the population of the State, coupled with the shortage of water which was experienced last summer in many places, must force resumption of this class of work in the near future. As there has probably been a permanent increase both in prices and in taxes, perhaps many municipalities which would have put in water systems if pre-war conditions had continued will now do without for many years, so that immediate recovery of the ground lost on account of the war cannot be expected. In this respect conditions are doubtless parallel in the building trades generally.

In this connection it is interesting to note the incidence of water supply applications since the State regulation of new water supply systems was undertaken:

1906	16	1913	16
1907	15	1914	29
1908	17	1915	30
1909	19	1916	16
1910	25	1917	13
1911	13	1918	4
1912	29	1919	7

The low figures of early years are due in part to more limited jurisdiction. The figures for 1914–1915 show the stimulation due to war industries and the low figures from 1916 on the reduction in construction due to the war. A study of these figures suggests that nearly forty applications have not been made to date which would probably have been made except for the war.

In two respects it seems that additional legislation amendatory of or supplementary to Article IX of the Conservation Law would be advisable.

In case of an emergency the Commission might well be empowered to grant a temporary permit for the use of a new or additional supply of water. Cases have arisen, and doubtless will again, when the supply of a community has failed, threatening the safety and health of the inhabitants unless almost instant measures of relief are adopted. The procedure on water supply applications, which is specified by the statute and which is proper and appropriate for ordinary cases, cannot be hurried to meet an emergency of this sort, so that the community affected must either suffer or proceed without authority from the State. It might be argued that by the exercise of due foresight on the part of the municipalites affected this emergency should never arise. It has, however, happened. Such cases are rare, but are serious.

The Legislature has not yet made it possible for a municipality to avail itself of the recent change in the constitution, permitting the use of State lands in the Forest Preserve for reservoirs for water supply purposes. At least one such project is now under contemplation, and it would seem that enabling legislation should be placed on the statute books.

Activity in the matter of sewerage construction, as measured by applications to the Commission for approval of the plans, has not suffered from war conditions as much as the water supply projects. However, a study of the applications received in recent years indicates that the greater part of them are for small sewerage projects and trades wastes disposal plants. These projects have been undertaken in some measure on account of the efforts of the State authorities to prevent the contamination of streams, the growth of manufacturing industries and the drive of the State Department of Health to improve the sanitary conditions of rural schoolhouses. About eighty cases of plans for sewerage or trades wastes treatment plants have come before this Commission during the year.

WATER SUPPLY APPLICATIONS

The following list shows the action taken on water supply applications during the year 1919.

No.	Applicant	Filed	Approved	Permit to operate
231	North Bangor Water Co., Inc..	....	....	Apr. 28
233	City of Olean................	....	....	June 25
241	Spring Brook Water Co.......	....	Jan. 24	Building
242	Glenwood Water District......	April 4	June 9	Nov. 25
243	Village of Newark............	April 8	May 28	Building
244	Village of Voorheesville.......	May 20	Aug. 21	Building
245	Village of Sidney.............	May 20	July 31	
246	Village of Nassau............	July 3	Aug. 28	Building
247	Clover Street Water District..	Nov. 15	Dec. 5	Building
248	Village of Long Beach........	Nov. 19	Dec. 10	Building
249	Endicott Water Works Co....	Dec. 29	Pending	
250	City of Newburgh............	Dec. 30	Pending	

DECISIONS ON WATER SUPPLY APPLICATIONS RENDERED DURING THE YEAR 1919

WATER SUPPLY APPLICATION No. 241

STATE OF NEW YORK — CONSERVATION COMMISSION.

In the Matter
of the
Application of the SPRING BROOK WATER COMPANY for Approval of Additional Water Supply.
Decision.

Application filed December 3, 1918.
Hearing held in Albany, December 20, 1918.
Decision, January 24, 1919.
Approved.

B. G. Higley, acting on behalf and in the name of the Spring Brook Water Company, of which he is the president, on December 3, 1918, filed an application with the Conservation Commission for approval of the project of that company for acquiring an additional source of water supply. On January 7, 1919, the Commission caused the site of the proposed source of water supply to be inspected by one of its engineers.

After due notice published in the Hudson Falls *Herald* a hearing was held on this application in the office of the Conservation Commission in the city of Albany on December 20, 1918, at 2 o'clock in the afternoon. At this hearing the Commission considered the petition, maps and plans submitted, examined witnesses and heard arguments in favor of the project, as shown by the minutes. No objections were filed and no one appeared in opposition. The petitioner was represented by B. G. Higley, president of the Spring Brook Water Company.

This company has drilled a well on its premises in the village of Hudson Falls, and permission is sought to utilize this well as an additional source of water supply for its customers in the village of Hudson Falls and adjacent territory. Water from this well will be pumped into the existing distribution reservoir and from there discharged into the existing distribution system.

After due study of the petition and its exhibits, the evidence and arguments given at the hearing and the report of the engineers of the Commission on this application, it appears as follows:

The Spring Brook Water Company is a domestic corporation, organized in 1888 under the provisions of the Transportation Corporations Law. This company has since 1889 been supplying water for public purposes and domestic use to the inhabitants of the village of Hudson Falls and adjacent parts of the towns of Fort Edward and Queensbury.

The present population of the village of Hudson Falls is estimated at 6,500 and the officials of the company estimate that they are now supplying water to a total population of approximately 7,500.

As shown by the financial statement filed with its petition, the Spring Brook Water Company has assets amounting to $265,017.79 and has outstanding capital stock to the amount of $30,000 and bonds to the amount of $200,000.

The present water supply of this company is derived in part from Cold brook, a stream which flows in a southerly direction into the Hudson river practically along the Warren-Washington county boundary line, and in part from springs which issue from the foot of a high bank, on the top of which is located the Glens Falls feeder of the Champlain canal. It also appears probable that a part of the present supply consists of seepage from this canal feeder. Water from these sources is collected in a system of four reservoirs having an aggregate capacity of 10,000,000 gallons. From the lower reservoir it is pumped into a steel standpipe 120 feet high, located in the central part of the village and having a capacity of 229,000 gallons. From here it is distributed to consumers through a distribution system containing about 15 miles of cast-iron pipe from 4 inches to 12 inches in diameter.

On various occasions, particularly in mid-winter when the surface supply is frozen up, and during protracted droughts in summer when the demands on the system for irrigating purposes are especially heavy, the quantity of water available in the reservoirs of this company has become so low as to cause considerable anxiety on the part of the officials of the company and the consumers in the village. The company has never been unable to supply its domestic consumers, though at times it has been obliged to restrict the supply to the mills and factories. The yield of the present sources of supply varies considerably, but at times it falls as low as 600,000 gallons per day. The quality of the present supply appears to be reasonably good, but not entirely satisfactory for domestic purposes without sterilization. All water now used, however, is sterilized with liquid chlorine before being delivered to consumers.

The average annual consumption is estimated at 703,000 gallons per day, but the average consumption for the month of November, 1918, was 720,000 gallons per day. It is estimated by the water company officials that about 40 per cent of the total supply is used by mills and factories in the village and that about 60 per cent represents domestic consumption. Though the present water supply has never completely failed, the reduced supply and the depletion of the reservoirs at times materially increase the fire hazard in the village.

To increase its available water supply the Spring Brook Water Company, on November 28, 1916, filed an application with this Commission for approval of a new source of supply from Walling brook, which flows from an extensive sandy plain lying a short distance easterly from the village. It was estimated in this application that from 200,000 to 300,000 gallons of water per day could be obtained from this source. This application was approved February 28, 1917. Owing, however, to the relatively high cost of construction and the rapidly rising cost of labor and materials, the company has not yet been able to develop this source of supply. The present application contemplates the use of water from the aforesaid well as an emergency water supply during the present winter and until the Walling brook supply can be developed.

At a meeting of the board of directors of the Spring Brook Water Company held December 14, 1918, the project of acquiring the proposed well supply was formally adopted and the president of the company was authorized to petition the Conservation Commission for approval thereof. All acts of the president in preparing and filing the petition to the Conservation Commission were formally approved and ratified.

The present application contemplates the use of water from a well which has been drilled on the premises of the applicant at a point about 120 feet south of the pumping station at the lower of the existing reservoirs. This well is 10 inches in diameter to a depth of approximately 160 feet and thereafter 6 inches in diameter to a depth of about 600 feet. The upper section of 160 feet, extending from the surface of the ground to and into the ledge rock, is cased with 10-inch extra heavy iron casing. It stated that sand was encountered from the surface of the ground a depth of about 130 feet. At this point rock was struck but the 10-inch bore was continued 30 feet into the rock. The casing was driven 10 feet into the rock in order to effectively protect the well from contamination by surface water. It is stated that under a 24-hour test the yield of the well averaged 115,000 gallons per day. It appears probable that this increased supply will be adequate for any increase in demand likely to occur in the near future. An analysis of the water from this well, filed by the applicant, indicates that the water is free from taste, odor and color, rather high in hardness, alkalinity and iron content, low in nitrogenous matter and free from bacteria of the colon type. As the water from the well is to be pumped into the distributing reservoir and will there be mixed with the spring and surface water supplies, the hardness and iron content will probably be so reduced as to become unobjectionable. As before stated, all water drawn from the distributing reservoir is sterilized with liquid chlorine before being delivered to consumers. No other treatment appears to be necessary at this time.

The water is to be pumped from the well by means of air lift pumping equipment, located in the existing pumping plant. This equipment consists of an 8 by 8 Ingersoll-Rand air compressor, operated by a 10-horsepower electric motor. The cost of the well is said to have been about $2,000 and the cost of the pumping equipment about $1,500. It is estimated that perhaps $200 additional will be required to complete the installation, making a total cost of $3,700. The Spring Brook Water Company appears to be financially able to complete these improvements.

All machinery appears to be in satisfactory operating condition and there is no reason to question its safety. The well is located on property now owned by the Spring Brook Water Company and no additional land is to be taken or acquired.

There are numerous other neighboring sources of supply which could be used to augment the water resources of this company, but the aforesaid well supply appears to be the logical source for emergency development.

The carrying out of this project will not adversely affect the water supply interests of any other community in the State.

The legal damages which may be caused by the execution of the plans of the petitioner do not appear to be such as to require any special consideration or legislative enactment in order that they may be equitably determined and paid.

In consideration of the above, and subject to the modifications hereafter stated, the Commission therefore finds and determines:

First. That the plans proposed are justified by public necessity.

Second. That said plans provide for the proper and safe construction of all work connected therewith.

Third. That said plans provide for the proper protection of the supply and the watershed from contamination and that filtration is at the present time unnecessary.

Fourth. That said plans are just and equitable to the other municipalities and civil divisions of the State affected thereby and to the inhabitants thereof, particular consideration being given to their present and future necessities for sources of water supply.

Fifth. That said plans make fair and equitable provisions for the determination and payment of any and all legal damages to persons and property, both direct and indirect, which will result from the execution of said plans.

Provided, however, that the said application, maps and plans as submitted shall be modified and the Commission does hereby determine that they be modified and that the work done thereunder be subject to the following conditions:

1. All the work proposed in this application shall be completely constructed in accordance with the plans as hereby revised.
2. All water supplied to any person, corporation or municipality by the Spring Brook Water Company shall be sterilized by liquid chlorine or other sterilizing agent in a manner satisfactory to this Commission.
3. After these works have been constructed they shall be inspected by and be subject to the approval of this Commission, and such works shall not be operated until permit to do so has been issued by this Commission, as provided by section 523 of the Conservation Law.

WHEREFORE, the Conservation Commission does hereby approve the said application of the Spring Brook Water Company as thus modified.

IN WITNESS WHEREOF, the Conservation Commission has caused this determination and approval to be signed by the Commissioner and has caused his official seal to be affixed hereto, and has filed the same with all maps, plans, reports and other papers relating thereto in its office in the city of Albany this 24th day of January, 1919.

[L. S.]

CONSERVATION COMMISSION,
GEO. D. PRATT,
Commissioner.

ATTEST:
WARWICK S. CARPENTER,
Secretary to the Commission.

WATER SUPPLY APPLICATION No. 242

STATE OF NEW YORK — CONSERVATION COMMISSION.

In the Matter
of the
Application of the Board of Water Commissioners of the GLENWOOD WATER DISTRICT for approval of its acquisition of a source of water supply and of its financial and engineering plans for the construction of a water supply system.
} *Decision.*

Application filed April 4, 1919.

Hearing held in Mineola, May 2, 1919.

Decision June 9, 1919.

Approved.

The water commissioners of the Glenwood water district, on April 4, 1919, filed with the Conservation Commission an application for approval of its acquisition of a source of water supply and of its financial and engineering plans for the construction of a water supply system. On May 2, 1919, the Commission caused the site of the proposed works and the proposed source of water supply to be inspected by its engineers.

After due notice published in the Sea Cliff *News* and the Glen Cove *Echo*, a hearing on this petition was held in the office of Harry W. Moore, attorney for the Glenwood water district, in the village of Mineola on May 2, 1919, at 10 o'clock in the forenoon. At this hearing the Commission considered the petition, maps and plans submitted, examined witnesses and heard arguments for the project as shown by the minutes. The petitioner was represented by Harry W. Moore, attorney at law. Messrs. Walter E. Sexton and Edward Gilligan appeared for the applicant. No objections were filed and no one appeared in opposition.

The project for which the approval of the Commission is asked consists of the construction of a distribution system covering the built-up part of the Glenwood water district and of a contract with the Roslyn water district for a supply of water.

After due study of the petition and its exhibits, the evidence and arguments given at the hearing and the report of the engineers of the Commission on this application, it appears as follows:

The Glenwood water district was formed under the provisions of the Town Law by the town board of the town of North Hempstead, county of Nassau, on March 3, 1919. It is located on the easterly shore of Hempstead harbor in the northerly part of the town of North Hempstead. The district has an area of about 330 acres and is bounded on the north by the town of Oyster Bay, on the southwest by the Port Washington water district and on the southeast by the Roslyn water district. The territory within the district is but sparsely built up, consisting largely of country homes occupied only during the summer months. The permanent population is estimated from 200 to 300 people. The assessed valuation of the taxable property within the district is $442,699.

The project for the construction of a water supply system was initiated by petition of the owners of more than 51 per cent of the taxable property lying within the district. This petition was presented to the town board on March 3, 1919, and the district was created on the same date. On March 17, 1919, Messrs. Benjamin T. Mott, Edward E. Bedell and Samuel Thorn, all residents of the district, were appointed water commissioners. The board of water commissioners of the Glenwood water district was officially organized on March 22, 1919, and Benjamin T. Mott was elected president and Samuel Thorn secretary of the district. The W. E. Sexton Company of Mineola, N. Y. were engaged as engineers for the district.

At the present time there is no public water supply system within the district and the inhabitants are obliged to obtain their water from wells, springs and cisterns. There is no fire protection except that provided by a volunteer fire company made up of residents of the towns of North Hempstead and Oyster Bay. This company has a fire station in the town of Oyster Bay near the northerly line of the Glenwood water district. Water for fire fighting purposes is obtained from the water-works system of the Sea Cliff Water Company. The protection thus afforded is entirely inadequate and fire insurance rates have been materially increased within the past few months.

The officials of the water district propose to purchase a supply of water from the Roslyn water district and to construct a distribution system within the Glenwood water district. Subject to the approval of the Conservation Commission, a contract has been made with the Roslyn water district to supply the Glenwood water district with water at the initial rate of 20 cents per thousand gallons.

The Roslyn water supply is derived from three 8-inch wells driven to a depth of about 250 feet at a point near the southwesterly shore of Hempstead harbor in the village of Roslyn. These wells have a total capacity of about 1,000,000 gallons per day, of which only about 360,000 gallons per day is used by the Roslyn water district. A surplus of nearly 700,000 gallons per day is, therefore, available for other purposes. The designing engineer estimates that the maximum requirements of the Glenwood water district will not exceed 100,000 gallons per day for several years to come.

No analyses of this water have been submitted, but water from deep wells on Long Island has been very generally used in this vicinity and has been found uniformly pure and satisfactory for all domestic purposes. The sanitary conditions around the Roslyn pumping station are good and there is no reason to doubt the purity of the water.

It is proposed to connect the distribution system of the Glenwood water district with the Roslyn mains at the intersection of Bryant avenue and Bulls Head road, which forms the boundary between the Roslyn and Glenwood water districts. From this point about 8,000 linear feet of 6-inch cast-iron pipe will be laid in the streets and roads of the Glenwood water district covering practically the whole of the built-up part of the district. The water used will be measured by a 6-inch compound meter set at the connection with the Roslyn mains. The distribution system will be provided with 20 fire hydrants, so spaced as to provide reasonably good fire protection within the Glenwood water district. The designing engineer estimates that it will be possible to concentrate two standard fire streams on any building within the district.

The designing engineer estimates the cost of this distribution system at $25,000. It appears probable that the work can be constructed within the amount of the estimate.

The Roslyn water supply system has been in use for several years and there is no reason to doubt the safety of either mains or pumping plant. The distribution system of the Glenwood water district appears to have been designed in accord with accepted practice, and, if properly constructed, it should be safe for the purposes for which it is designed. Owing to the high quality of water derived from the deep wells in the Long Island sands, it does not appear necessary to provide at this time for the filtration or other purification of this water. The proposed water mains and pipes of the Glenwood water district are all to be laid within the public streets and no lands are to be acquired by the district.

While the Glenwood water district could develop its own source of water supply by constructing wells within the district along the easterly shore of Hempstead harbor similar to those developed by the Roslyn water district, it would not be economical to do so at the present time because of the large investment required and the high operating expenses incidental to the supplying of the small quantity of water required by the district. Inasmuch as the Roslyn water district has a large surplus of water, it will be more economical for both districts to utilize the same source of supply, as provided in the plans submitted.

The approval of this application will have no effect on the water supply interests of any other community, except the Roslyn water district, and the supply of this district can be materially increased by the construction of additional wells, if such action should in the future become necessary.

The legal damages which may be caused by the execution of the plans of the petitioner do not appear to be such as to require any special consideration or legislative enactment in order that they may be equitably determined and paid.

In consideration of the above, and subject to the modifications hereafter stated, the Commission therefore finds and determines:

First. That the plans proposed are justified by public necessity.

Second. That said plans provide for the proper and safe construction of all work connected therewith.

Third. That said plans provide for the proper protection of the supply and the watershed from contamination and that filtration is at the present time unnecessary.

Fourth. That said plans are just and equitable to the other municipalities and civil divisions of the State affected thereby and to the inhabitants thereof, particular consideration being given to their present and future necessities for sources of water supply.

Fifth. That said plans make fair and equitable provisions for the determination and payment of any and all legal damages to persons and property, both direct and indirect, which will result from the execution of said plans or the acquiring of said lands.

Provided, however, that the said application, maps and plans as submitted shall be modified and the Commission does hereby determine that they be modified and that the work done thereunder be subject to the following conditions:

1. All the work proposed in this application shall be completely constructed in accordance with the plans as hereby approved.
2. After these works have been constructed they shall be inspected by and be subject to the approval of this Commission, and such works shall not be operated until permit to do so has been issued by this Commission, as provided by section 523 of the Conservation Law.

WHEREFORE, the Conservation Commission does hereby approve the said application of the Glenwood Water District as thus modified.

[L. S.] IN WITNESS WHEREOF, the Conservation Commission has caused this determination and approval to be signed by the Deputy Commissioner and has caused its official seal to be affixed hereto and has filed the same with all maps, plans, reports and other papers relating thereto in its office in the city of Albany, this 9th day of June, 1919.

CONSERVATION COMMISSION,
A. MACDONALD,
Deputy Commissioner.

Attest: WARWICK S. CARPENTER,
Secretary to the Commission.

WATER SUPPLY APPLICATION No. 243

STATE OF NEW YORK — CONSERVATION COMMISSION.

In the Matter
of the
Application of the VILLAGE OF NEWARK, for approval of its acquisition of a source of water supply and of its financial and engineering plans for the construction of a water supply system.
} *Decision.*

Application filed April 8, 1919.
Hearing held in the village of Newark, April 29, 1919.
Decision, May 28, 1919.
Approved.

The village of Newark, on April 8, 1919, filed with the Conservation Commission an application for approval of its acquisition of a source of water supply and of its financial and engineering plans for the construction of a water supply system. On April 29, 1919, the Commission caused the site of the proposed works and the proposed source of water supply to be inspected by its engineers.

After due notice published in the Newark *Courier* and the Newark *Union-Gazette,* a hearing was held on this application in the village hall in the village of Newark on April 29, 1919, at 2 o'clock in the afternoon. At this hearing the Commission considered the petition, maps and plans submitted, examined witnesses and heard arguments for the project, as shown by the minutes. The petitioner was represented by John H. Egan, village attorney. No objections were filed and no one appeared in opposition.

The project for which the approval of the Commission is asked is a new surface water supply to be derived from Case creek, a small stream rising in the hills a few miles south of the village near Seneca Castle. This project includes the acquisition of necessary lands and the construction of a storage reservoir, a filtration plant and a supply main leading from the proposed reservoir to the existing distribution system in the village.

After due study of the petition and its exhibits, the evidence and arguments given at the hearing and the report of the engineers of the Commission on this application it appears as follows:

The village of Newark is a municipal corporation, incorporated as a village in 1839 and is located in the town of Arcadia, Wayne county. It is a residential and manufacturing town, having a population of about 6,500 and is traversed by the New York Central railroad, the Northern Central railroad, the electric line of the New York State railways and the Barge canal. The assessed valuation, according to the last assessment roll, is $3,853,323. The outstanding bonded indebtedness is $98,000, including $24,000 water bonds.

For a number of years the question of an additional water supply has been actively agitated by the inhabitants of the village. The present supply is obtained partly from wells and springs and partly from Ganargua creek, a stream which flows through the northerly part of the village and is locally known as Mud creek.

The present water supply system consists of a series of springs, four driven wells, a pumping station, a distributing reservoir and distribution system covering practically the whole of the built up part of the village. The original waterworks system of the village of Newark was constructed about 1888 by a private water company. This system was taken over by the village in 1905, and various additions and improvements have been made since that date.

The so-called springs consist of a covered concrete collecting gallery and one or more lines of collecting tile laid along the foot of a hillside about one-half mile northwest of the village. Water flows by gravity to a pumping station, from which it is pumped to the village distribution system. The supply of water from these springs became insufficient for the needs of the village about ten years ago and an additional supply was obtained by drilling four 8-inch wells to a depth of about 100 feet on a plot of ground acquired by the village near the pumping station. Water is raised from these wells by an air lift pumping system to a sufficient height to permit it to flow by gravity from the wells to the above mentioned pumping station, which is located about midway between the springs and wells. From the pumping station the water is pumped to the village distribution system through a 12-inch cast-iron force main. The distribution system consists of about 16 miles of cast-iron pipe from 4 inches to 12 inches in diameter and about 170 fire hydrants, so spaced as to give reasonably good fire protection. The greater part of the system is metered, there being 1,100 metered services and 200 flat rate consumers. The total cost of the existing system to the present date is about $100,000.

For the past two or three years the consumption has exceeded the available supply from both springs and wells. The shortage became so serious during the winter of 1918 that a connection was made with Ganargua creek and water was pumped therefrom into the distribution system. All water taken from this creek, however, was sterilized with liquid chlorine before being delivered to consumers. During the year 1918 from one-third to one-half of the total quantity of water used was pumped from Ganargua creek. The water from this creek is grossly polluted and is unsafe for domestic use without complete purification by filtration and sterilization. The quality of the water from the springs and wells appears to be reasonably satisfactory, but deficient in quantity.

While the average annual consumption is about 420,000 gallons per day, during the summer months the consumption often exceeds 600,000 gallons per day. The population appears to be increasing slowly and the water consumption per capita is also said to be increasing. During a protracted dry period only about half the quantity of wate required by the village can be obtained from the existing springs and wells. When sufficient water is available, reasonably good fire protection is provided by a 900,000-gallon reservoir located on high ground just west of the village line, together with one fire engine, one hook and ladder company and two hose carts. The superintendent of water works states that seven standard fire streams can be concentrated on a given point in the central part of the village. The static pressure in the business section is said to be 75 pounds per square inch.

The village has a municipal sewerage system serving practically the whole of the village. The sewage is treated in a disposal plant consisting of coarse screens, Imhoff settling tanks, sprinkling filters and secondary settling tanks. The effluent from the disposal plant is discharged into Ganargua creek.

The project now before the Commission was formally initiated at a meeting of the board of trustees of the village held February 4, 1919, at which time the submission of the matter to a vote of the people was authorized. The election was, accordingly, held on March 18, 1919, and was carried by a vote of 375 to 127. At the same election the village officials were authorized to issue bonds to the amount of $280,000 for the construction of the proposed additional water supply. On April 1, 1919, the board of trustees authorized the village president, F. C. Donnelly, to sign and execute in behalf of the village the petition now before the Commission.

James P. Wells, a consulting engineer having an office in Rochester, made the preliminary investigations and prepared the plans submitted with the application.

The watershed tributary to the proposed storage reservoir on Case creek has an area of approximately 7 square miles, as shown by the maps of the United States Geological Survey. The land within this watershed consists almost entirely of well cultivated farm land. No measurements of the flow of this stream are available, but it appears probable that a reasonably accurate estimate of its flow can be computed from the records of the Little Tonawanda creek at Linden. The drainage areas of these two streams receive nearly the same annual rainfall and have similar characteristics, except that the Linden watershed lies at a somewhat higher altitude.

These records indicate that the flow of Case creek will probably fall as low as 140,000 gallons per day for periods of from one to three months during a dry summer. With the proposed storage reservoir, however, having a net capacity of 180,000,000 gallons, the Linden records indicate that a flow of approximately 1,400,000 gallons per day can be maintained from the watershed tributary to the proposed reservoir.

The designing engineer estimates that the present average annual consumption of 420,000 gallons per day will probably be increased to not less than 650,000 gallons per day when the new supply becomes available. After considering the probable growth in population, the increase in water consumption and probable increase in commercial demands, the engineer estimates that a supply of one million gallons per day should be sufficient for several years to come, and he has, accordingly, designed the proposed works on that basis. It appears reasonably certain that this quantity of water can be obtained from the proposed source of supply with the amount of storage provided for.

Two sets of analyses of the water from Case creek have been submitted. One set of these analyses was made from samples collected April 10, 1919, just after a heavy rain, while the creek was in flood. These analyses indicate that on that date the water was extremely turbid, comparatively hard and contained considerable amounts of decomposing and decomposable organic matter. The bacterial count was extremely high and B. coli were present in practically all samples even as small as 0.01 c.c. The second set of analyses was made from samples collected April 24, 1919, after the flood had passed and the flow had fallen to approximately normal spring flow. These analyses indicate that the turbidity on that date was comparatively low, that the water was moderately hard and that it still contained considerable decomposing and decomposable organic matter. The bacterial count, however, was moderate with B. coli present in all 10 c.c. samples, in most of the 1 c.c. samples, but absent in all the 0.1 and 0.01 c.c. samples.

The first set of samples, taken during the flood period while the stream was receiving the spring drainage from heavily manured fields, is of little value in determining the normal quality of this water. The second set, however, indicates that the water is of fair quality for surface water, but not safe for domestic use without filtration or other form of purification. An inspection of the watershed shows no particular sources of contamination except farm buildings. The watershed contains about 60 farm houses and supports a population of perhaps 250, or about 36 persons per square mile.

The plans of the village provide for filtration of this water and, if necessary, sterilization by liquid chlorine. The village officials also state that they propose to apply to the State Department of Health for the enactment of rules and regulations for the protection of the watershed.

The proposed storage reservoir is to be created by building a dam across Case creek at a point perhaps one-half mile above its junction with Flint creek, a tributary to Canandaigua lake outlet. It will have an area at flow line of about 110 acres and a maximum depth of about 22 feet. With the proposed draft of 10 feet the capacity will be about 198,000,000 gallons.

The designing engineer estimates the loss due to evaporation at about 18,000,000 gallons, leaving 180,000,000 gallons net storage. The land within the reservoir basin is chiefly farm land, from which it is proposed to remove all brush, trees and similar matter.

The main dam is to be an earth and concrete structure 450 feet long with a maximum height of 20 feet. The earth section will have slopes of 1 on 2 with a top width of 10 feet and a freeboard of 5 feet. A concrete core wall extending to rock or impervious material is provided. The spillway, located near the westerly end of the dam, will be a concrete weir of gravity type, 80 feet long, 10 feet high with crest elevation 685, 5 feet below the top of the adjacent earth embankments. A concrete core wall will extend 5 feet below the base of the dam, presumably to rock or impervious material. A ledge of shale rock is exposed in the bed of the creek at the dam site. The soil at this point appears to be a reasonably impervious sandy and clayey loam. The spillway will discharge into a concrete paved channel leading to the creek below the dam. This channel will be paved with a 12-inch slab of concrete laid between concrete retaining walls 4 feet high above the top of the pavement.

In addition to the main dam a long low dike across a depression just east of the main dam will be required. This dike will be about 2,300 feet long with a maximum height of 28 feet, but for the greater part of the length the height will be less than 5 feet. A concrete core wall is provided in the higher section of the dike. The slope of the upstream side of this dike will be 1 on 2½ on the higher part of the dike and 1 on 2 on the lower sections. The downstream slope will be 1 on 2 throughout. The top width will be 10 feet on the higher part of the dike and 8 feet on the lower parts. The upstream face of all earth structures subject to wave wash is to be rip rapped with stone to a depth of 12 inches.

The outlet works will be located at a point about 350 feet from the easterly end of the dike and will consist of a 14-inch cast-iron pipe laid on a concrete foundation in a trench under the dam with two concrete collars or water stops between the intake and the core wall. A reinforced concrete gate well is to be constructed in the middle of the dam and equipped with a 14-inch flanged gate valve operated by a hand wheel at the top of the well. The entrance to the pipe is to be protected by a concrete intake chamber 4 feet square and 4 feet deep, covered by a white oak rack made up of 2-inch bars spaced 7 inches center to center.

The regulating gate chamber is to be a reinforced concrete structure 8 feet by 12 feet in plan and 7 feet deep, inside dimensions, located about 50 feet below the foot of the dam. It will be equipped with three 14-inch gate valves and a screen "fish trap." The valves are so arranged that the water may be passed to the filtering plant and discharged into a brook at a point about 130 feet from the regulating chamber. The fish trap is located between two of the valves on the line to the filter plant and may be opened for the removal of its contents.

The purification works will be located in a brick and concrete building located below the dam and adjacent to the above mentioned gate chamber. The plant will consist of an aerator, a precipitation basin, a mechanical gravity filter and a clear water well. The aerator will be of the fountain type and will be operated by the head of water in the reservoir. The precipitating basin will be of the usual type for the use of aluminum sulphate as a precipitant. The filters will be of the usual mechanical gravity type and will be constructed in two sections, each having a capacity of 500,000 gallons per day. The clear water well will be located under the filters and will have a capacity of approximately 36,000 gallons. The plant is to be equipped with rate controllers, loss of head gage and clear water well gage. The detail plans for the filtration plant will be supplied by the bidders thereon and have not yet been submitted.

Water will be conducted from the clear water well to the village distribution system through a 14-inch cast-iron supply main about 38,000 feet long. The high flow line of the reservoir will be at elevation 685 and the low flow line at 675, while the surface of the distributing reservoir in the village is 630, leaving a minimum gross head of 45 feet. The head loss in the filter plant is estimated by the designing engineer at 7 feet, leaving 38 feet for friction head in the pipe line. This is approximately one foot per thousand. With this friction loss a 14-inch cast-iron pipe after several years' use should have a carrying capacity of approximately 1,050,000 gallons per day. This is slightly in excess of the estimated maximum requirement.

The supply main will be connected with the village distribution system in the southerly part of the village at a point near the intersection of Main and Maple streets. No changes in the distribution system are contemplated in this application. The pipe line will cross two streams, namely, Flint creek and Canandaigua lake outlet. At these crossings the pipe will be laid in a trench excavated in the beds of the streams and will be encased in concrete. It will be equipped with air vents and blow-off valves at various points and will be laid with an average cover of 3½ feet.

The designing engineer estimates the cost of the proposed works as follows:

Dams and dikes	$62,825 00
Filtration plant	21,000 00
Laying pipe	27,607 50
Furnishing pipe valves, etc	89,690 00
Fences	1,000 00
Land and rights of way	32,000 00
Engineering and contingencies, 10 per cent	23,412 25
Total	$257,534 75
Authorized bond issue	$280,000 00

It appears probable that the work can be constructed within the estimated amount and that ample provision has been made for the financing of the work.

All structures for which plans have been submitted appear to have been designed in accord with recognized practice and, if carefully constructed, should be safe for the purposes for which they are intended.

It is estimated that about 265 acres of land will be required for the proposed reservoir. Of this amount it is estimated that perhaps 60 acres may later be sold.

The pipe line, in general, will follow the highways, but about two miles of it will be laid across private lands. It appears probable that all necessary lands and rights of way can be obtained within the estimate of $32,000 therefor.

There are several other possible sources of supply which appear to have been rather extensively investigated by the designing engineer. There are two other streams, one on either side of Case creek, from which a gravity supply could probably be obtained, but neither appears to offer advantages over the stream selected by the designing engineer. The only logical source of supply located near the village appears to be Ganargua creek. This water is grossly polluted and would require constant pumping. A project to utilize this source of supply was decisively voted down by the electors of the village in July, 1918. The designing engineer has submitted cost curves, which indicate that the annual cost of the supply from Ganargua creek, properly filtered and sterilized, would be somewhat cheaper than the proposed supply from Case creek for the first twelve years of operation, but that after that time the Case creek supply would be materially cheaper than that from Ganargua creek.

It does not appear that the taking of the proposed water supply from Case creek by the village of Newark will adversely affect the water supply interests of any other community. The available supply of water from Case creek can be materially increased by raising the dam and thus increasing the capacity of the reservoir.

The legal damages which may be caused by the execution of the plans of the petitioner do not appear to be such as to require any special consideration or legislative enactment in order that they may be equitably determined and paid.

In consideration of the above, and subject to the modifications hereafter stated, the Commission therefore finds and determines:

First. That the plans proposed are justified by public necessity.

Second. That said plans provide for the proper and safe construction of all work connected therewith.

Third. That said plans provide for the proper protection of the supply and the watershed from contamination and for the proper filtration of such additional supply.

Fourth. That said plans are just and equitable to the other municipalities and civil divisions of the State affected thereby and to the inhabitants thereof, particular consideration being given to their present and future necessities for sources of water supply.

Fifth. That said plans make fair and equitable provisions for the determination and payment of any and all legal damages to persons and property, both direct and indirect, which will result from the execution of said plans or the acquiring of said lands.

Provided, however, that the said application, maps and plans as submitted shall be modified and the Commission does hereby determine that they be modified and that the work done thereunder be subject to the following conditions:

1. All work proposed in this application shall be completely constructed in accordance with plans which have been submitted to and approved by this Commission.

2. Contracts for the proposed filter plant shall not be let, nor work started thereon, until complete detail plans therefor have been submitted to and approved by this Commission.

3. The village authorities shall apply to the State Department of Health for rules and regulations for the protection of the watershed, and shall enact and diligently enforce such rules and regulations.

4. After these works have been constructed they shall be inspected by and be subject to the approval of this Commission, and such works shall not be operated until permit to do so has been issued by this Commission, as provided by section 523 of the Conservation Law.

WHEREFORE, the Conservation Commission does hereby approve the said application of the Village of Newark as thus modified.

IN WITNESS WHEREOF, the Conservation Commission has caused this determination and approval to be signed by the deputy commissioner and has caused its official seal to be affixed hereto and has [L. S.] filed the same with all maps, plans, reports and other papers relating thereto in its office in the city of Albany this 28th day of May, 1919.

CONSERVATION COMMISSION,
A. MACDONALD,
Deputy Commissioner.

Attest: WARWICK S. CARPENTER,
Secretary to the Commission.

WATER SUPPLY APPLICATION No. 244

STATE OF NEW YORK — CONSERVATION COMMISSION.

In the Matter
of the
Application of the VILLAGE OF VOORHEESVILLE
for Additional Water Supply.
} *Decision.*

Application filed May 20, 1919.
Hearing held in Voorheesville, June 20, 1919.
Decision August 21, 1919.
Approved.

The village of Voorheesville, on May 20, 1919, filed with this Commission a petition for approval of its plans for an additional water supply. On June 20, 1919, the Commission caused the site of the proposed works and the proposed source of water supply to be inspected by its engineers.

After due notice published in the Altamont *Enterprise* and the Albany *Evening Journal*, a hearing on this petition was held in the village hose house in the village of Voorheesville on June 20, 1919, at 2 o'clock in the afternoon. At this hearing the Commission considered the petition, maps and plans, examined witnesses and heard arguments for the project as shown by the minutes. The petitioner was represented by Stephen J. Daring, village attorney, and William R. Kimmey, village engineer. No objections were filed and no one appeared in opposition.

For the purpose of increasing its supply of water for domestic use and fire protection, the village proposes to acquire a spring which flows from the rocks on the easterly side of the Helderberg mountains and to pipe the water therefrom to its existing reservoir. The proposed improvements will consist of a concrete collecting basin and about one mile of 3-inch galvanized iron pipe leading from the spring to the reservoir, together with necessary lands and rights of way.

After due study of the petition and its exhibits, the evidence and arguments given at the hearing, and the report of the engineers of the Commission on this application, it appears as follows:

Voorheesville was incorporated as a village under the provisions of the Village Law in 1899. It is located in the town of New Scotland, Albany county, at the junction of the Delaware and Hudson and the West Shore railroads, about 11 miles west of the city of Albany. The population, according to the census of 1915, was 550 and it is now estimated at about 700. The assessed valuation of the taxable property within the village is $285,000. The bonded indebtedness is $9,000, of which $8,000 was issued for water supply purposes.

For several years past the village has suffered from shortage of water during the summer months. The deficiency has at times been so severe that it has been necessary to prohibit the sprinkling of lawns and to restrict consumption in every possible way. In spite of these precautions the distributing reservoir has at times been completely emptied and the pressure in the mains has fallen almost to zero. Because of this shortage of water the fire underwriters have recently increased fire insurance rates nearly 50 per cent.

The present water supply system of the village was constructed in 1900. Water is obtained from six springs located on the easterly side of the Helderberg mountains about 4 miles southwest of the village and about one mile west of the hamlet of New Salem. It is said that only two of these springs flows continuously in a dry period. From these springs the water flows by gravity through iron pipes into a storage reservoir located just north of the highway leading through New Scotland and New Salem. This reservoir has an area of about one-half acre and a capacity of about 700,000 gallons. It is protected from contamination by surface drainage from the above mentioned highway by a well kept ditch along the upper side of the reservoir. From the reservoir to the village distribution system the water is conducted through a 4-inch cast-iron pipe about three and one-half miles long. The distribution system consists of about 16,000 feet of 4-inch cast-iron pipe, covering substantially the whole of the built-up part of the village. The system is equipped with 40 fire hydrants.

There are no available records of the yield of the springs from which the village derives its water supply, but the supply appears to be sufficient for the reasonable needs of the village during perhaps eight or nine months of the year. Services are not metered and there is no record of consumption, but it is estimated at from 30,000 to 35,000 gallons per day by the village engineer.

No recent analyses of the water are available, but analyses made in 1916 by the State Department of Health indicate that the water is quite hard and that it was at that time subject to some active contamination which may have been due to surface water reaching the springs.

Fire protection is provided by a volunteer fire department, and one hose cart with a reel of hose. When the reservoir is full, two half-inch fire streams can be supplied with water under a pressure of 40 pounds, but during the dry period when the reservoir is empty, the pressure drops practically to zero. It is thus evident that fire protection is very poor. This is partly due to shortage of water and partly because of the small size of the supply main leading from the reservoir to the village. The static pressure in the central part of the village is said to be from 90 to 95 pounds.

Proceedings toward the acquisition of an additional water supply were initiated on February 28, 1918, when the village board of trustees authorized the submission of the proposition to acquire and develop the above-mentioned spring supply and to issue bonds to the amount of $5,000 in payment therefor to a vote of the people at the annual village election. At this election, held March 19, 1918, the proposition was carried by a vote of 46 to 20. The petition to this Commission was authorized by the board of trustees at a meeting held February 28, 1919.

The spring which the village proposes to utilize flows from a hole or shallow cave at the foot of a high ledge of rock on the easterly side of the Helderberg mountains at a point about one mile north of the existing reservoir and about 300 feet higher than the reservoir. The hillside above the ledge is densely wooded for at least one-half mile above the spring, and it appears to be well protected from contamination. There are no visible sources of pollution and the water should be of satisfactory quality for all domestic purposes. This is confirmed by analyses made by the State Department of Health in May, 1919, which show the water to be quite hard, but of excellent sanitary quality. The bacterial count was only 10 per cubic centimeter and there were no bacteria of the coli type in nine samples. Filtration or other purification of this water does not at present appear to be necessary.

No measurements have been made of the flow of this spring, but local people say that it has never failed even in the driest seasons. The flow on June 20, 1919, was estimated at from 30,000 to 40,000 gallons per day. The village engineer states that from his personal knowledge of this spring he feels confident that during the dry season the flow of the spring will exceed 50 per cent of its flow on that day, or from 15,000 to 20,000 gallons per day.

The collecting works at the spring will consist of a small concrete collecting basin located in the cave from which the spring flows. From this basin the water will be piped to the existing distribution reservoir through a 3-inch galvanized iron pipe. This pipe will be laid on the surface of the ground from the collecting basin to the foot of the talus slope below the spring, and from the foot of this slope to the reservoir it will be laid in a trench following the base of the hill. It is intended that the spring water shall be used only during the summer months, and the pipe will be shut off at the beginning of winter; but to prevent any possibility of freezing it is to be left entirely open and equipped with only one valve, which will be placed at the entrance to the pipe. Blow-off cocks, for the purpose of draining the pipe, will be placed at all low points.

The village engineer estimates that the cost of this work will not exceed $4,000 for the collecting basin and pipe line, and that the cost of the entire project will not exceed the bond issue of $5,000. This estimate appears to be reasonable if the necessary lands and rights of way can be obtained for a reasonable sum and without resorting to condemnation. As the pipe line between the spring and the reservoir will be open at the resrvoir end, there will be no material pressure in the pipe, and there appears to be no reason to question its safety. Its carrying capacity will be considerably in excess of the estimated flow of the spring. The village has already purchased 16 acres of land surrounding the spring and will acquire a right of way across the land lying between the spring lot and the distributing reservoir.

There are several other possible sources of supply, among which may be mentioned Vly creek and its tributaries. The water from this creek, however, would require filtration, and it would be necessary to resort to pumping. There does not appear to be available any spring supply other than the one proposed in this application. This spring appears to be the logical and most practicable source of supply within the limits of its capacity. If the estimated flow from 15,000 to 20,000 gallons per day during dry periods is realized, it is probable that the present actual needs of the village will be supplied, but there will be little or no surplus for future increase in demand. If the population of the village should be greatly increased, however, it will be necessary to rebuild practically the entire system, including the supply main and distribution system.

It does not appear that the water supply interests of any other community will be adversely affected by the acquisition of this spring by the village of Voorheesville.

The legal damages which may be caused by the execution of the plans of the petitioner do not appear to be such as to require any special consideration or legislative enactment in order that they may be equitably determined and paid.

In consideration of the above, and subject to the modifications hereafter stated, the Commission therefore finds and determines:

First. That the plans proposed are justified by public necessity.

Second. That said plans provide for the proper and safe construction of all work connected therewith.

Third. That said plans provide for the proper protection of the supply and the watershed from contamination and that filtration is at the present time unnecessary.

Fourth. That said plans are just and equitable to the other municipalities and civil divisions of the State affected thereby and to the inhabitants thereof, particular consideration being given to their present and future necessities for sources of water supply.

Fifth. That said plans make fair and equitable provisions for the determination and payment of any and all legal damages to persons and property, both direct and indirect, which will result from the execution of said plans or the acquiring of said lands.

Provided, however, that the said application, maps and plans as submitted shall be modified and the Commission does hereby determine that they be modified and that the work done thereunder be subject to the following conditions:

1. All the work proposed in this application shall be completely constructed in accordance with the plans as hereby approved.

2. After these works have been constructed, they shall be inspected by and be subject to the approval of this Commission, and such works shall not be operated until permit to do so has been issued by this Commission, as provided by section 523 of the Conservation Law.

WHEREFORE, the Conservation Commission does hereby approve the said application of the village of Voorheesville as thus modified.

IN WITNESS WHEREOF, the Conservation Commission has caused this determination and approval to be signed by the deputy commissioner and has caused its official seal to be affixed hereto and has [L. S.] filed the same with all maps, plans, reports and other papers relating thereto in its office in the city of Albany this 21st day of August, 1919.

CONSERVATION COMMISSION,
A. MACDONALD,
Deputy Commissioner.

Attest: WARWICK S. CARPENTER,
Secretary to the Commission.

WATER SUPPLY APPLICATION No. 245

STATE OF NEW YORK — CONSERVATION COMMISSION.

In the Matter
of the
Application of the VILLAGE OF SIDNEY for Approval of Its Acquisition of the Source of Water Supply and Plant Property and System of the Sidney Water Works Company. } *Decision.*

Application filed May 20, 1919.
Hearing held in Sidney, June 17, 1919.
Decision July 31, 1919.
Approved.

The village of Sidney on May 20, 1919, filed with this Commission a petition for approval of its acquisition by condemnation of the water supply system of the Sidney Water Works Company, and on June 17, 1919, the Commission caused this water works system to be inspected by one of its engineers.

After due notice published in the Sidney *Record* and the Sidney *Enterprise*, a hearing on this petition was held in Municipal Hall in the village of Sidney, on June 17, 1919, at 2 o'clock in the afternoon. At this hearing, the Commission considered the petition, maps and plans submitted, examined witnesses and heard arguments for the project, as shown by the minutes. The petitioner was represented by the firm of Sewall and France, attorneys-at-law, and H. C. Stratton, of counsel. Charles C. Hopkins, consulting engineer, of Rochester, N. Y., also appeared for the petitioner. Jerome S. Secord, attorney-at-law, appeared for the Sidney Water Works Company. No objections were filed and no one appeared in opposition.

The project for which the approval of this Commission is asked consists of the acquisition by the village of the entire water supply system of the Sidney Water Works Company including all lands, water rights, rights of way, franchises, reservoirs, distribution system and all appurtenances, including tools and supplies necessary for the operation of the system.

After due study of the petition and its exhibits, the evidence and arguments given at the hearing and the report of the engineers of the Commission on this application, it appears as follows:

The village of Sidney was incorporated under the provisions of the Village Law in 1888. It is located on the Susquehanna river, just above the mouth of the Unadilla river in the town of Sidney, Chenango county. The Delaware and Hudson and the New York, Ontario and Western railroads pass through the village. The population of the village according to the 1915 census was 2,641 and it is now estimated at about 3,000. The assessed valuation according to the last assessment roll was $1,279,957. The bonded indebtedness is $40,497.50, none of which was incurred for water supply purposes.

Since 1889, a public water supply system has been operated in the village of Sidney by the Sidney Water Works Company, a domestic corporation organized under the Transportation Corporations Law. At the present time, this company supplies water to the inhabitants of the village of Sidney and to other residents in the town of Sidney, Delaware county; also to residents in the town of Unadilla, Otsego county, and in the towns of Guilford and Bainbridge, Chenango county. It has a franchise to supply water in the town and also in the village of Bainbridge.

The original source of water supply utilized by this company was Collar brook, a tributary of the Susquehanna river, from which water was diverted at a point about two miles southeast of the village, in the town of Sidney, Delaware county. At the present time, there are four reservoirs on this stream with capacities respectively of 288,000; 4,398,000; 4,819,000 and 13,424,000 gallons, making a total of 22,929,000 gallons on this watershed. The lowermost and smallest of these reservoirs, which was really built to intercept a leak under the dam of the reservoir immediately above it, is at an elevation of 206 feet above the level of the railroad tracks at the Sidney station.

In passing from reservoir No. 2 to the lowermost reservoir (No. 1) the water flows through a bed of coarse gravel and from thence into a well or flume house, the discharge from which is regulated by a float valve. From the flume house, the water flows to a small gate house and from thence through an aeration fountain into reservoir No. 1. In the bottom of this reservoir is installed a rather crude mechanical filter consisting of two rectangular concrete tanks 12 by 14 feet in plan and 11 feet deep, in the bottom of which is a strainer system of the ordinary type, covered by a bed of sand. No coagulant is used with this filter and it can be washed only by drawing down the water in the reservoir and allowing water from No. 2 to flow through it in the reverse direction.

From reservoir No. 1 to the village distribution system, the water is conducted through an 8-inch cast-iron pipe. It is estimated that the Collar

Brook system delivers perhaps one-third of the water supplied by this company to its customers.

The total drainage area tributary to the reservoir on Collar brook, as shown by the United States Geological Survey map, is about 1.6 square miles, consisting largely of farm lands, though a considerable percentage, perhaps 40 to 50 per cent of the area, is wooded. Several farm houses are located on the watershed and cattle are pastured upon it and watered in some of the streams tributary to Collar brook. No serious sources of pollution exist, except the few farm houses and the pasture lands above mentioned. The nearest farm, located immediately above the upper reservoir, has been acquired by the water company and the buildings are to be torn down or moved away.

No recent analyses of this water are available, but analyses made three or four years ago indicate that it is at times contaminated by bacteria of animal origin and that the filters are not efficient in removing such contamination.

As the supply from Collar brook proved insufficient to meet the demands of the customers of the water company, in 1901 a 6-inch pipe was laid from Sidney to a dam on Guilford creek. This creek is the outlet of Guilford lake and it flows through the town of Guilford in Chenango county into the Unadilla river. The water company purchased or constructed a diverting dam on this stream some three miles above the village. It also purchased a small storage reservoir on the same stream nearly two miles further upstream. This intake dam is at an elevation of 164 feet above the railroad tracks at the station. This head is too small to permit the water to be used in connection with the Collar brook supply. The water of Guilford creek at this point drains from a rather thickly settled farming community and is undoubtedly contaminated and unfit for use without purification.

In 1904, two Jewell pressure filters were installed to purify this supply and they are in use at the present time for the supply of the hamlet of East Guilford. These filters are not provided with coagulation tanks and though equipped with alum pots, no coagulant is being used at the present time. There is no information at hand to show the efficiency of these filters, but it is undoubtedly very low. The village officials state that no water from Guilford creek is allowed to enter the distribution system in the village of Sidney.

When it became evident that Guilford creek could not be used to augment the supply from Collar brook, the water company in 1908 built a reservoir on Peckham brook, at a point about two and one-half miles northwest of the village in the town of Guilford, Chenango county. Peckham brook is a tributary of the Unadilla river, and it has above the water company's dam a drainage area of about four square miles, as shown by the United States Geological Survey map. This reservoir has a capacity of 43,232,000 gallons. Water is drawn from it through a pile of cobble stones, sand and gravel and then filtered through two mechanical filters in the gate house. These filters consist of two beds of sand and gravel with an underdrainage system. They operate with from 30 to 40 feet of water on the beds, and it seems certain that these beds can never be effectively washed. There is no coagulation or clear water basin and no coagulant is used.

The Peckham reservoir was originally connected to the distribution system by a 6-inch cast-iron pipe, but about one-half of this line has since been replaced with 8-inch and 10-inch cast-iron pipe. The elevation of the water surface in the reservoir is 204 feet above the railroad track at the Sidney station.

The watershed above the Peckham reservoir consists largely of farm and pasture land with a considerable percentage of wooded land. Sources of contamination exist in several farm houses located on the watershed, some of them close to tributary brooks. The water company, however, has spent considerable money in improving sanitary conditions and a considerable period of storage is provided in the reservoir itself. The older analyses, however, indicate that this water is sometimes contaminated by bacteria of animal origin and that the filters are not efficient. In past years, some difficulty has been experienced with growths of algae in the reservoir. The crude filter now in use is not well adapted to the removal of the tastes and odors caused by these growths.

It is estimated that the Peckham reservoir supplies about two-thirds of the amount of water consumed by the village.

The distribution system consists of about 72 feet of 12-inch, 5,562 feet of 10-inch, 13,212 feet of 8-inch, 29,327 feet of 6-inch and 20,638 feet of 4-inch cast-iron pipe, making a total of about 13 miles of cast-iron pipe. In addition to this, there are about 2.2 miles of wrought-iron pipe from 1 inch to 4 inches in diameter. The system is equipped with 51 fire hydrants, 92 gate valves and the usual number of valve boxes and other appurtenances.

There are no statistics as to the yield of either the Collar Brook or the Peckham systems. With the existing storage of 23,000,000 gallons on the Collar Brook system, however, its drainage area of 1.6 square miles should be capable of supplying a continuous flow of about 190,000 gallons per day, based upon the records of other streams in this State. The Peckham system, with 43,000,000 gallons of storage and 4 square miles of watershed, should produce on the same basis about 440,000 gallons per day, making a total of about 630,000 gallons per day. The yield from both of these systems can be materially increased by additional storage. A suitable site for a fifth reservoir on Collar brook exists at a point a short distance above the upper reservoir. The capacity of the Peckham reservoir can be materially increased by raising the existing dam.

There are no statistics as to the consumption of water in the village, but it is estimated by the village engineer at about 600,000 gallons per day. It is, therefore, evident that in normal times the Peckham and Collar Brook systems will supply the ordinary demand and that by further development of these sources the probable future requirements can be taken care of without undue expense. The watershed tributary to Guilford creek at the East Guilford intake is about 18 or 20 square miles and it is, therefore, evident that the low water flow of this stream will be more than sufficient for the few dwellings supplied from this source.

As before stated, no recent analyses of the water from any of these systems have been submitted, but an analysis of water from a tap in the village, made by the State Department of Health in August, 1916, indicates that the water is reasonably soft and that it is somewhat contaminated by organic matter. The number of bacteria present was 550 per cubic centimeter, but bacteria of the coli type were absent in all samples. The watersheds are patrolled by an employee of the company two or three times a month and a careful watch is kept for sources of pollution. There have been no epidemics of typhoid fever or intestinal diseases in the village for a considerable number of years.

Water from Collar and Peckham brooks appears to be of reasonably good quality for a surface supply, and if no new sources of pollution are established on the watersheds and the village maintains a vigorous patrol of these areas, it will be safe to use for the present. Added safety to health and improved physical quality can be obtained by the installation of suitable filtration and sterilization plants and such plants should perhaps be installed as soon as the village finances will permit. The Commission reserves the right to require the installation of suitable sterilizing apparatus, or the construction of filters, whenever future conditions indicate the necessity therefor.

As before stated, the Guilford creek supply at East Guilford is unfit for use without purification and the existing filters are inadequate. The East Guilford system is connected with the Sidney distribution system by a 6-inch main and there appears to be no reason why the few consumers in East Guilford should not be supplied with water from the Peckham and Collar Brook supplies. The quantity of water required would be small and would not materially reduce the quantity available for use in the village of Sidney. This would make it possible to discontinue the East Guilford supply, or to use it only for commercial purposes by laying a second main from the East Guilford intake to the village. The Commission will, therefore, require that the East Guilford supply be discontinued or that the existing pressure filter plant be remodeled in a satisfactory manner.

Reasonably good fire protection is provided by three volunteer fire companies equipped with a modern engine, hose carts and hose. The village engineer estimates that it would be possible to concentrate four standard fire streams on any point in the built-up section of the village. The supply mains from the Peckham and Collar Brook reservoirs, however, are rather small, and, in order to provide assurance against a shortage of water during a large fire the 6-inch pipe remaining in the line to the Peckham reservoir should be replaced with pipe not less than 8 or perhaps 10 inches in diameter.

For a considerable number of years there has been more or less dissatisfaction with the rates and service supplied by the Sidney Water Works Company and also considerable agitation for a municipally owned water supply system. Proceedings toward the acquisition of the water supply system of the Sidney Water Works Company by the village were begun January 17, 1917, when a special election was held to authorize the purchase of the property rights and equipment of the Sidney Water Works Company for the sum of $165,000. The proposition was carried in the affirmative and, on April 6, 1917, the board of water commissioners in conjunction with the board of trustees of the village made an offer to the water works company to purchase the system at that price. This offer was refused by the company. Condemnation proceedings were instituted shortly thereafter and Messrs. George B. Curtis, Harry M. Beardslee and Frank A. Frost were appointed condemnation commissioners by Justice McCann of the Supreme Court. The award of the condemnation commission was filed January 17, 1919, the amount of the award being $220,000, which was $55,000 in excess of the sum which had been authorized at the election held January 17, 1917. This made it necessary for the water commissioners to again go to the people for authority to raise the additional funds necessary. At an election held March 18, 1919, the trustees were accordingly authorized to accept the award of the condemnation commission and to issue bonds to the amount of $228,000. Of this sum $220,000 is to be paid to the water company and the additional $8,000 is for other necessary expenses. The petition to the Conservation Commission was authorized by the board of trustees at a meeting held April 1, 1919.

There are no statistics available as to the original cost of this water works system but the award of $220,000 by the condemnation commission indicates its present value.

Inasmuch as these dams and pipe lines have been in use from 10 to 20 years, there appears to be no reason to question their safety.

In taking over the existing works the village does not intend to acquire any lands other than those now in use for water supply purposes, or to make any material changes in the system, except such extensions to the distribution system as may be necessary. Additional land will be required only if additional storage capacity is to be provided, or for additional sanitary protection.

Other sources of supply exist, among which may be mentioned the Susquehanna and Unadilla rivers, but these waters are highly contaminated and would require filtration and pumping. The existing system appears to be the logical source of supply for the village of Sidney. It does not appear that any other community will be affected by the acquisition of this supply by the village of Sidney.

The legal damages which may be caused by the execution of the plans of the petitioner do not appear to be such as to require any special consideration or legislative enactment in order that they may be equitably determined and paid.

In consideration of the above, and subject to the modifications hereafter stated, the Commission therefore finds and determines:

First. That the plans proposed are justified by public necessity.

Second. That said plans provide for the proper and safe construction of all work connected therewith.

Third. That said plans provide for the proper protection of the supply and the watershed from contamination and that filtration is at the present time unnecessary.

Fourth. That said plans are just and equitable to the other municipalities and civil divisions of the State affected thereby and to the inhabitants thereof, particular consideration being given to their present and future necessities for sources of water supply.

Fifth. That said plans make fair and equitable provisions for the determination and payment of any and all legal damages to persons and property, both direct and indirect, which will result from the execution of said plans or the acquiring of said lands.

Provided, however, that the said application, maps and plans as submitted shall be modified and the Commission does hereby determine that they be modified and that the work done thereunder be subject to the following conditions:

1. No water from Guilford creek shall be used except after purification by a properly equipped plant in a manner satisfactory to this Com-

mission. Until such plant has been constructed, the use of water from Guilford creek shall be discontinued and the inhabitants of East Guilford shall be supplied with water from the Collar brook and Peckham water supplies.

2. Whenever future analyses or changed conditions show it to be necessary, in the opinion of this Commission, the village shall install properly designed and equipped sterilization or filtration plants on the Collar brook and Peckham water supply systems, and thereafter all water taken from these sources of supply shall be adequately purified before being delivered to consumers.

WHEREFORE, the Conservation Commission does hereby approve the said application of the village of Sidney as thus modified.

IN WITNESS WHEREOF, the Conservation Commission has caused this determination and approval to be signed by the Commissioner and [L. S.] has caused its official seal to be affixed hereto and has filed the same with all maps, plans, reports and other papers relating thereto in its office in the city of Albany, this 31st day of July, 1919.

CONSERVATION COMMISSION,
A. MACDONALD,
Deputy Commissioner.

Attest. WARWICK S. CARPENTER,
Secretary to the Commission.

WATER SUPPLY APPLICATION No. 246

STATE OF NEW YORK — CONSERVATION COMMISSION.

In the Matter of the Application of the VILLLAGE OF NASSAU, for Approval of its Acquisition of a Source of Water Supply and of Its Financial and Engineering Plans for the Construction of a Water Supply System. } *Decision.*

Application filed July 3, 1919.
Hearing held in Nassau, July 16, 1919.
Decision, August 28, 1919.
Approved.

The village of Nassau, on July 3, 1919, filed with this Commission a petition for approval of its acquisition of a source of water supply and of its financial and engineering plans for the construction of a water supply system. On July 16, 1919, the Commission caused the site of the proposed works and the proposed source of water supply to be inspected by its engineers.

After due notice published in the Albany *Evening Journal* and the *Knickerbocker Press* a hearing on this petition was held in Winters Hall in the village of Nassau on July 16, 1919, at 2 o'clock in the afternoon. At this hearing the Commission considered the petition, maps and plans submitted, examined witnesses and heard arguments for the project, as shown by the minutes. The petitioner was represented by Ralph M. Cooper, village attorney, and by Albrecht O. Kosegarten, village president. Preliminary investigations were made and plans prepared by Robert E. Horton, consulting eningeer of Albany, N. Y. No objections were filed and no one appeared in opposition.

The project for which the approval of the Commission is asked consists of the driving of five wells on the flat land near the easterly bank of Valatie creek in the southwesterly part of the village, the construction of a pumping station and a new distributing reservoir with necessary piping and connections, and the acquisition of 1.57 acres of land on which these structures will be located.

The wells will be located approximately in a line, about 97 feet apart and about 500 feet east of Valatie creek. The soil at this point is of gravel and sand and is now under cultivation. The water from the wells will be pumped into the existing distribution system and from thence into a small reservoir located on the hillside near the existing reservoir. The wells will be constructed by excavating pits a few feet deep and by driving two 1½-inch diameter well points in each pit. These points will be driven to a depth to be designated by the designing engineer and equipped with 36-inch strainers.

The pumping station will be constructed over the middle well and will be connected with the two adjacent wells by suction lines of 3-inch galvanized iron pipe. These wells will in turn be connected with the outer wells by lines of 2-inch galvanized iron pipe.

The pump house will be 9 feet by 12 feet in plan and will be constructed of concrete and covered by a shingle roof. It will be equipped with a Gould triplex-plunger pump, now owned by the village and formerly used to pump water from Valatie creek. This pump will be operated by a 7½-horsepower electric motor. A 4-inch cast-iron main about 1,200 feet long will convey the water from the pumping station to the village distribution system.

To provide a constant pumping head and separate storage for well water, it is proposed to construct a new reservoir, by damming a small ravine, at a point about 400 feet southwest and 12 feet higher than the existing reservoir. This new reservoir will have an area of about 50 by 75 feet and a maximum depth of about 6 feet. Its capacity will be about 50,000 gallons, or approximately one day's consumption.

According to the plans submitted, the dam forming this reservoir will be of concrete, about 75 feet long, 7 feet high and with a cut-off wall extending 1.5 feet into the shale rock foundation. A 4-inch cast-iron pipe about 600 feet long will connect the new reservoir with the main leading from the existing reservoir to the village distribution system. A check valve will be placed between the junction of the two pipes and the old reservoir. The plans do not provide for any changes or additions to the existing distribution system.

After due study of the petition and its exhibits, the evidence and arguments given at the hearing and the report of the engineers of the Commission on this application, it appears as follows:

Nassau was incorporated as a village by a special act of the Legislature in 1819. It is located in the town of Nassau, Rensselaer county, on the Albany

Southern railroad, about 13 miles southeast of the city of Albany. It population is estimated at 550, of which about 75 per cent are supplied with water from the municipal system. The assessed valuation of the taxable property within the village limits is $270,000. The outstanding bonded indebtedness is $9,150, all of which was incurred for water supply purposes.

Proceedings toward the acquisition of an additional water supply were formally initiated February 28, 1919, on which date the village board of trustees authorized the submission of the project to obtain an additional supply of water and to issue bonds to the amount of $5,000 in payment therefor to a vote of the people at the annual village election. This election was held March 18, 1919, and the proposition was approved by a vote of 46 in the affirmative to 27 in the negative. The petition to the Conservation Commission was authorized by the board of trustees at a meeting held June 30, 1919.

The village of Nassau has been supplied with water from a municipally owned system since 1902. The supply is derived chiefly from a small stream on which a storage reservoir of about 1,000,000 gallons capacity has been constructed at a point about one mile southeast of the village. This supply is augmented by water from a spring and two dug wells in a field a short distance north of the reservoir.

The reservoir was created by building a low earth dam with a masonry core wall across a small ravine. This reservoir is about 300 feet long and 150 feet wide and is said to be from 6 to 8 feet deep. A masonry spillway 12 feet long, founded on shale rock, has been constructed on the westerly side of the reservoir. There are no dwellings on the tributary watershed, which consists largely of farm land and has an area of about 82 acres. There is a farm road along the easterly side of the reservoir, but the reservoir lot is fenced to prevent the entrance of domestic animals. A 6-inch cast-iron pipe connects the reservoir with the village distribution system.

The above mentioned spring is housed in a covered brick collecting basin located in a pasture lot a short distance northwest of the reservoir. The area of the watershed tributary to this spring is estimated by the designing engineer at 84 acres. On this watershed two wells, each about 6 or 7 feet deep, have been dug and curbed with stone, and the water therefrom is piped to the spring collecting basin. These wells apparently receive chiefly surface water and perhaps a small amount of ground water. The brick collecting basin at the spring is connected by a 4-inch cast-iron pipe with the 6-inch main from the storage reservoir. The village distribution system consists of about 2 miles of mains from 4 inches to 8 inches in diameter.

There are no records of the yield of the existing sources of supply, but it is said to be sufficient for the ordinary needs of the village for from 8 to 9 months of the year. During the remainder of the year the supply falls materially below the needs of the village. The designing engineer estimates that during a protracted dry period the existing sources will not yield over 10,000 gallons per day. To relieve the resulting shortage, the village has, during recent years, resorted to the pumping of water from Valatie creek, which flows through the westerly part of the village. For this purpose the village has installed a Gould triplex pump operated by water power and having a capacity of about 100 gallons per minute.

The quality of the water from the springs, wells and reservoir appears to be reasonably good for surface water. Analyses made by the State Department of Health in 1918 and previous years indicate that the water is moderately hard, reasonably free from objectionable color and turbidity and that it contains a moderate amount of nitrogenous organic matter. Occasional high bacterial counts and the rather frequent presence of bacteria of the coli type indicate that it is subject to contamination of human or animal origin. As there are no dwellings on either watershed, and the locality is not frequented by human beings, it is probable that the contamination indicated by the analyses is due to wash from the surrounding farm lands. The water pumped from Valatie creek, however, is grossly contaminated and a menace to the lives and health of the people of this village. The use of this creek water has never been authorized by the State and this Commission will require that the use thereof be discontinued.

There are no records of consumption of water by the village, but the designing engineer estimates the consumption at from 40,000 to 50,000 gallons per day when available. He also estimates that 50,000 gallons per day will supply the ordinary needs of the village at the present time and that 60,000 gallons per day will provide for a reasonable period in the future. As before stated, the supply from existing sources, other than Valatie creek, falls as low as 10,000 gallons per day, leaving a deficiency of about 40,000 gallons per day at present requirements.

A fair degree of fire protection is provided when water is available, but it is entirely inadequate during dry periods when the reservoir supply is exhausted. The average pressure in the village is said to be about 60 pounds.

The designing engineer estimates that a supply of about 150,000 gallons per day can be obtained by continuous pumping from the proposed wells above described. This estimate is based on pumping tests on test wells driven in the locality of the proposed wells. As this quantity is more than three times the quantity of water required to make up the deficiency in the existing supply, it should be unnecessary to pump more than a few hours each day if the estimated yield is realized.

Analyses made by the State Department of Health in August, 1918, indicate that the water from these wells is moderately soft and of very low bacterial count with no coli present in 18 samples tested. There are no visible sources of pollution and the water should be of satisfactory quality for all domestic purposes.

For the protection of the wells the village proposes to purchase about 1.29 acres of land on which the wells are to be located and to erect a substantial fence around the property. If the wells are thus protected against contamination, filtration of the water appears to be unnecessary.

After the proposed works have been constructed, it is proposed to keep the existing reservoir full at all times, thus providing a storage of about 1,000,000 gallons for fire service and reserve in case of breakdown of the pumping plant. Fire protection will be greatly improved if this plan is carried out.

The designing engineer estimates the cost of the proposed improvements at $4,997.27, not including the pump which is now owned by the village. This estimate appears to be reasonable, and it is probable that the proposed works can be constructed within the appropriation of $5,000.

The proposed structures appear to have been designed in accord with accepted practice and, if constructed in accordance with the plans, they should be safe and adequate for the purposes for which they are designed. No provision, however, has been made for protecting the proposed distributing reservoir from contamination by surface drainage. A ditch should be constructed around the upper side of this reservoir in such manner as to prevent surface drainage from entering the reservoir.

To safeguard the quality of the existing supplies, it would be advisable for the village in conjunction with the State Department of Health to enact rules and regulations for the sanitary protection of the tributary watersheds.

Only two small parcels of land, aggregating 1.57 acres, will be required. It is not anticipated that there will be any difficulty in obtaining this land at reasonable cost.

There are several alternative sources of supply which have been given rather careful consideration by the designing engineer and by the engineers of the State Department of Health. Among these supplies may be mentioned Valatie creek, Nassau pond and Merchants spring. All these supplies, however, are more or less subject to surface contamination and all would require pumping. The proposed wells appear to be the logical source of additional supply for the village of Nassau.

It does not appear that the construction of these wells will have any effect on the water supply interests of any other community.

The legal damages which may be caused by the execution of the plans of the petitioner do not appear to be such as to require any special consideration or legislative enactment in order that they may be equitably determined and paid.

In consideration of the above, and subject to the modifications hereafter stated, the Commission therefore finds and determines:

First. That the plans proposed are justified by public necessity.

Second. That said plans provide for the proper and safe construction of all work connected therewith.

Third. That said plans provide for the proper protection of the supply and the watershed from contamination and that filtration is at the present time unnecessary.

Fourth. That said plans are just and equitable to the other municipalities and civil divisions of the State affected thereby and to the inhabitants thereof, particular consideration being given to their present and future necessities for sources of water supply.

Fifth. That said plans make fair and equitable provisions for the determination and payment of any and all legal damage to persons and property, both direct and indirect, which will result from the execution of said plans or the acquiring of said lands.

Provided however that the said application, maps and plans as submitted shall be modified and the Commission does hereby determine that they be modified and that the work done thereunder be subject to the following conditions:

1. All the work proposed in this application shall be completely constructed in accordance with the plans as hereby revised.
2. After the construction of these works, the waters of Valatie creek shall not again be used as a source of water supply for the village of Nassau.

3. The proposed distributing reservoir shall be so constructed as to prevent the entrance of surface water therein.

4. After these works have been constructed they shall be inspected by and be subject to the approval of this Commission, and such works shall not be operated until permit to do so has been issued by this Commission as provided by section 523 of the Conservation Law.

WHEREFORE, the Conservation Commission does hereby approve the said application of the village of Nassau as thus modified.

IN WITNESS WHEREOF, the Conservation Commission has caused this determination and approval to be signed by the Commissioner and has caused its official seal to be affixed hereto and has filed the same with all maps, plans, reports and other papers relating thereto in its office in the city of Albany this 28th day August, 1919.

[L. S.]

CONSERVATION COMMISSION,
GEO. D. PRATT,
Commissioner.

Attest: J. J. FARRELL,
Assistant Secretary to the Commission.

WATER SUPPLY APPLICATION No. 247

STATE OF NEW YORK — CONSERVATION COMMISSION.

In the Matter of the Application of the CLOVER STREET WATER DISTRICT for Extension of Its Boundaries and System.	*Decision.*

Application filed November 15, 1919.
Hearing held in Rochester, November 25, 1919.
Decision, December 5, 1919.
Approved.

Isaac J. Hartfelt, George M. Keller and James E. Smith, water commissioners for the Clover Street water district, in the town of Brighton, Monroe county, N. Y., on November 14, 1919, made application to the Conservation Commission for approval of the project of the petitioners of enlarging the Clover Street water district and extending the water supply system of the district to supply the additional area with water. This application was filed November 15, 1919.

After due notice published in the *Democrat and Chronicle* of Rochester and the Rochester *Times-Union*, a hearing was held on this petition in the offices of Reed, Shutt, Downs and Shutt in the Wilder building, in the city of Rochester, on November 25, 1919, at 10:00 o'clock in the forenoon. At this hearing the Commission considered the petition, maps and plans submitted, examined witnesses and heard arguments for the project. The petitioners appeared in person and were represented by C. Porter Downs, Esq., their attorney. No objections were filed and no one appeared in opposition.

It is proposed to extend the existing waterworks system of the Clover Street water district into an area recently annexed to that district. These extensions consist of 2,500 feet of 6-inch cast-iron pipe laid on Penfield road and four fire hydrants. Valves and other appurtenances are to be installed on this pipe line in the usual manner.

After due study of the petition and its exhibits, the evidence and arguments given at the hearing, and the report of the engineers of the Commission on this application, it appears as follows:

Clover Street water district was formed by order of the town board of the town of Brighton, Monroe county, December 19, 1913. On October 24, 1919, a petition for the extension of this district was filed in the town clerk's office and, at a special meeting of the town board of the town of Brighton, held November 6, 1919, such extension to the district was made. It appears that the assessed valuation of the annexed area is $59,000 and the population about 100. The money appropriated for the extension of the water mains into the annexed portion of the district is $6,500.

In approving the original application of the Clover Street water district, the Conservation Commission, in its decision dated January 29, 1914, states as follows:

> "Objection to the granting of this application was made by Mr. Laass and by the executor of the Curtis Estate, on the grounds that, although they had signed the original taxpayers' petition to the town board of Brighton, all the property of Mr. Laass and all but a small portion of the Curtis Estate had been excluded from the district as formed. In reply to these objections it was stated by the petitioners that it had been their intention to include this property in the district, but that, through a misunderstanding as to the location thereof, this had not been done. The water commissioners and their attorney stipulated that they would favor the enlargement of the district so as to correct this error. No further objections were offered."
>
> "And the Commission further determines that if the town board of the town of Brighton shall hereafter extend the boundaries of Clover Street water district to include the property adjacent to this district owned by Emil Laass and that known as the Curtis Estate, the above findings and determinations will apply to the district so enlarged."

It appears that the area recently annexed to the Clover Street water district is the area above referred to; which this Commission has already determined should be supplied with water as a part of the Clover Street water district.

The annexed area will be supplied with Lake Ontario water, filtered and pumped by the Rochester and Lake Ontario Water Company. This water is of good quality and the company can supply the additional population of this district without injury to the interests of the other districts supplied by it.

It seems probable that the proposed additional works can be constructed at a cost not exceeding the sum of $2,500 available for the purpose.

These works, if properly constructed in accordance with the specifications submitted, of suitable materials and careful workmanship, will be safe and adequate.

No land is to be purchased or acquired for the installation of the proposed additions to the mains of the Clover Street water district.

The construction and operation of the proposed waterworks system will not adversely affect the present or future water supply interests of any other municipality or civil division of the State.

The legal damages which may be caused by the execution of the plans of the petitioners do not appear to be such as to require any special consideration or legislative enactment in order that they may be equitably determined and paid.

In consideration of the above, the Commission therefore finds and determines:

First. That the plans proposed are justified by public necessity.

Second. That said plans provide for the proper and safe construction of all work connected therewith.

Third. That said plans provide for the proper protection of the supply and the watershed from contamination and for the proper filtration of such additional supply.

Fourth. That said plans are just and equitable to the other municipalities and civil divisions of the State affected thereby and to the inhabitants thereof, particular consideration being given to their present and future necessities for sources of water supply.

Fifth. That said plans make fair and equitable provisions for the determination and payment of any and all legal damages to persons and property, both direct and indirect, which will result from the execution of said plans or the acquiring of said lands.

Provided, however, that the said application, maps and plans as submitted shall be modified and the Commission does hereby determine that they be modified and that the work done thereunder be subject to the following conditions:

1. All the work proposed in this application shall be completely constructed in accordance with the plans as hereby revised.
2. After these works have been constructed they shall be inspected by and be subject to the approval of this Commission, and such works shall not be operated until permit to do so has been issued by this Commission, as provided by section 523 of the Conservation Law.

WHEREFORE, the Conservation Commission does hereby approve the said application of the Clover Street water district as thus modified.

IN WITNESS WHEREOF, the Conservation Commission has caused this determination and approval to be signed by the Deputy Commissioner and has caused its official seal to be affixed hereto and has filed the same with all maps, plans, reports and other papers relating thereto in its office in the city of Albany, this 5th day of December, 1919.

[L. S.]

CONSERVATION COMMISSION,
A. MACDONALD,
Deputy Commissioner.

Attest: WARWICK S. CARPENTER,
Secretary to the Commission.

WATER SUPPLY APPLICATION No. 248

STATE OF NEW YORK — CONSERVATION COMMISSION.

In the Matter
of the
Application of the VILLAGE OF LONG BEACH for Approval of its Acquisition of a Source of Water Supply, etc., and of Its Financial and Engineering Plans for the Construction of a Water Supply System.
} *Decision.*

Application filed November 19, 1919.

Hearing held in Long Beach, November 29, 1919.

Decision, December 10, 1919.

Approved.

William H. Reynolds, acting on behalf and in the name of the village of Long Beach, of which he is the president, on November 18, 1919, made application to the Conservation Commission for its approval of the project of said village for the installation of a municipally owned public water supply system therein and the acquisition of a source of water supply therefor. This petition was filed in the office of the Conservation Commission November 19, 1919. On November 29, 1919, the Commission caused the sites of the proposed works and the proposed source of water supply to be inspected by one of its engineers.

After due notice published in the *South Side Observer* of Rockville Center and the *Long Beach Life* of Long Beach, a hearing on this petition was held in the village hall in the village of Long Beach on November 29, 1919, at 9:45 in the forenoon. At this hearing the Commission considered the petition, maps and plans submitted, examined witnesses and heard arguments for the project as shown by the minutes. The petitioner was represented by the Hon. William H. Reynolds, village president, and Charles C. Clark, Esq., village attorney. No objections were filed and no one appeared in opposition.

The project now under consideration is for the installation of a municipally owned water supply system to take the place of the privately owned system, which now supplies this village and certain neighboring territory with water. The village desires to acquire the source of water supply, standpipe and distribution system now in use and to construct a new force main connecting the pumping station in East Rockaway with the standpipe in Long Beach. In case the property of the water company cannot advantageously be acquired, the village desires to duplicate the system with new construction.

After due study of the petition and its exhibits, the evidence and arguments given at the hearing and the report of the engineers of the Commission on this application, it appears as follows:

Long Beach is an incorporated village in the town of Hempstead, Nassau county, N. Y. It is situated on Long Beach, an island parallel to the south shore of Long Island, fronting on the Atlantic Ocean. According to the petition the normal summer population of this village is about 5,000, the total assessed valuation by the last roll was $5,138,290 and the village has a bonded indebtedness of $295,500, none of which was incurred for water supply purposes. This village is primarily a summer resort having a small permanent and a large summer population. The buildings in the central portion of the village are of permanent construction and high cost. Some of the outlying sections are wooden bungalow developments, the houses being quite close together.

Since 1907 the section now known as the village of Long Beach and territory adjacent thereto has been supplied with water for domestic and public purposes and fire protection by the Long Beach Water Company. This company operated in this area by virtue of a contract entered into between it and the Estates of Long Beach, a realty development company which originally owned this entire section, the last contract between the two bearing date of January 3, 1910. The Estates is a minority stockholder in the Company.

Water is obtained from a dug well situated near the northern boundary of the village of East Rockaway, in the town of Hempstead, this well having been sunk on a plot of land, three and one-half acres in extent, east of and adjacent to the intersection of Rocklyn avenue and the Long Beach branch of the Long Island railroad. The well is 50 feet deep with a pipe strainer section extending to a total depth of 72 feet. Water is pumped from it by means of duplicate sets of 2-stage, 6-inch Worthington turbine pumps, each direct connected to a 100 horsepower induction motor. Current to operate the motors is supplied by a steam-driven 100 k.w. generator, or is obtained from the transmission lines of the Queensborough Gas and Electric Company. All this machinery, together with the necessary boilers and accessories, is housed in a substantial brick pumping station. The capacity of the pumps is stated to be about 2,000,000 gallons per day against 240 feet of head.

Water from the wells is pumped to a standpipe in Long Beach through 20,000 feet of 24-inch force main. This main is machine-banded wood-stave pipe, except at creek and channel crossings, where it is Ward-joint cast-iron pipe. The standpipe is of steel, 34 feet in diameter and 150 feet high, with a capacity of 1,000,000 gallons. The maximum pressure given by this standpipe on the mains of the village is 65 pounds per square inch.

In the village of Long Beach and the territory adjacent thereto there is a distribution system consisting of about 14 miles of cast-iron pipe, ranging in diameter from 24 inches to 4 inches, the bulk of the laterals being 6 inches in diameter and 4-inch pipe being used only to prevent dead ends. This system contains also suitable valves at intervals of about 600 feet and 163 double nozzle fire hydrants located about 400 feet apart.

According to analyses submitted by the petitioner and those published in the reports of the State Department of Health, the quality of water supplied by the company has always been excellent. The well is located at such a distance from the nearest dwellings as to obviate serious danger of pollution. and suitable methods have been taken to prevent the pollution of the water therefrom by the operatives at the pumping station.

The consumption of water in the area supplied by the company at present varies between 200,000 and 750,000 gallons per day. It is believed that the existing well has an ultimate capacity of approximately 2,000,000 gallons per day. No trouble with shortage of water due to failure of the supply has been experienced.

As the force main runs for practically its entire length through a salt marsh, it has deteriorated with great rapidity. The bands have corroded and broken and the wood itself has disintegrated. As a result, for some years it has been possible to keep this line in service only by continual repair and it can now carry water only under about 30 pounds of pressure, which is too low for fire protection purposes. Therefore, not only is the village without adequate fire protection, but frequently a break in the force main leaves it without any water for considerable periods of time. On account of the high cost of materials, labor and supplies, the water company is in financial difficulties and has found itself unable to replace the force main or to make needed extensions to the system.

The above-mentioned agreement between the Long Beach Water Company and the Estates of Long Beach provides that, in case the company shall at any time fail properly to operate its system or to make the extensions necessary to keep up with the growth of the village, the estates may, on 60 days' notice, take over the property of the company. The value of the property is then to be appraised and the estates are to pay the company 60 per cent of the value so determined. Appraisal is to be made of the physical plant only, exclusive of any value of franchises or other privileges. It is also provided that, in case the company absolutely fails to supply water for any period of two days, the estates may take immediate possession of the works and operate the same until such time as the respective rights of the parties can be determined.

The owners of the water company having decided that they would not put any more money into it, the company notified the estates that it would cease operation after September 30, 1919, whereupon the estates gave the company the required formal 60 days' notice and took over the plant. Steps have been taken towards the appraisal, but this work has not been completed.

As the Estates of Long Beach had no desire to operate the waterworks system, it allowed the village authorities to take it over and operate it, there being an understanding between the officials of the village and the estates that as soon as the latter acquires title to the property, it will sell it to the village; the estates also agreeing to procure the necessary rights of way and permits to allow the village to supply water to various portions of Long Beach, controlled by the estates, but outside of the village limits. The village proposes to proceed in this way, but has not entered into a formal agreement with the estates for the acquisition of the property. In case the existing system cannot advantageously be obtained in this manner, the village can either condemn it or duplicate it with new construction.

On account of the lack of fire protection and the precarious nature of the existing force main, the village immediately took steps towards the construction of a new force main, leaving the question of the taking over of the distribution system to be settled later.

At a meeting held October 9, 1919, the trustees of the village called a special election to vote on a proposition to bond the village in the sum of $200,000 for the installation of a municipal water supply system. This election was held October 23, 1919, and carried unanimously, there being 34 votes for the project and none against it.

The petition shows that William H. Reynolds is the duly elected, qualified and acting president of the village; he having been re-elected for a second term, and having entered upon the duties of this office, June 23, 1919. The present application to the Conservation Commission was authorized by a resolution of the board of trustees of the village of Long Beach at a meeting held November 17, 1919.

It is proposed to continue to supply the village and surrounding area from the well which has been supplying it since 1907. Apparently ample water for present purposes is obtainable from this well and the amount can be augmented by the sinking of additional wells on the property now owned by the company and which the village proposes to acquire.

The water which has been supplied to this section seems always to have been of good quality, and there is no reason to anticipate that this condition will be changed. In addition, as a further safeguard against unforeseen contingencies, the village proposes to sterilize with liquid chlorine all water pumped by it.

It is estimated that the new force main will cost $120,000 and that the remainder of the project can be carried out for a sum not exceeding $80,000. On account of the peculiar legal and local conditions, it is difficult to estimate the probable cost of this project, but the available appropriation of $200,000 seems reasonably adequate.

The new force main, if properly constructed, of suitable materials and with careful workmanship, will be safe. The existing well, pumping station, standpipe and distribution system appear to be safe and adequate.

The pumping station lot now owned by the water company is to be acquired by the village, also a right of way for the new force main and the plot about the standpipe.

Alternative sources of supply exist, but none of these offer greater advantages than that which the village proposes to acquire.

The various communities near Long Beach and East Rockaway are adequately supplied with water from wells situated at various points on Long Island. None of these wells are so close to the water company's well that interference between them need be anticipated. It, therefore, seems that this project can be carried out without injury to the interests of any other civil division of the State, either as to its present or future requirements for water supply.

The legal damages which may be caused by the execution of the plans of the petitioner do not appear to be such as to require any special consideration or legislative enactment in order that they may be equitably determined and paid.

In consideration of the above and subject to the modifications hereafter stated, the Commission therefore finds and determines:

First. That the plans proposed are justified by public necessity.

Second. That said plans provide for the proper and safe construction of all work connected therewith.

Third. That said plans provide for the proper protection of the supply and the watershed from contamination and for the proper purification of such additional supply.

Fourth. That said plans are just and equitable to the other municipalities and civil divisions of the State affected thereby and to the inhabitants thereof, particular consideration being given to their present and future necessities for sources of water supply.

Fifth. That said plans make fair and equitable provisions for the determination and payment of any and all legal damages to persons and property, both direct and indirect, which will result from the execution of said plans or the acquiring of said lands.

Provided, however, that the said application, maps and plans as submitted shall be modified and the Commission does hereby determine that they be modified and that the work done thereunder be subject to the following conditions:

1. All the work proposed in this application shall be completely constructed in accordance with the plans as hereby revised.
2. In the event that the village does not acquire the existing distribution system, but constructs a new system, this must be completely constructed in accordance with plans which have previously been submitted to and approved by this Commission. In the event that the village decides to develop a source of water supply different from that now used by the Long Beach Water Company, application for approval thereof by this Commission must be made in due form.
3. After these works have been constructed they shall be inspected by and be subject to the approval of this Commission, and such works shall not be operated until permit to do so has been issued by this Commission, as provided by section 523 of the Conservation Law.

WHEREFORE, the Conservation Commission does hereby approve the said application of the Village of Long Beach as thus modified.

[L. S.] IN WITNESS WHEREOF, the Conservation Commission has caused this determination and approval to be signed by the Commissioner and has caused its official seal to be affixed hereto and has filed the same with all maps, plans, reports and other papers relating thereto in its office in the city of Albany this 10th day of December, 1919.

CONSERVATION COMMISSION,
GEO. D. PRATT,
Commissioner.

Attest: WARWICK S. CARPENTER,
Secretary to the Commission.

SEWERAGE APPLICATIONS

The following list indicates the action taken on sewerage applications during the year 1919:

No.	Applicant	Approved by State Department of Health	Approved by Conservation Commission
684.	Endicott-Johnson Corp., wastes	Mar. 24, 1919	April 10, 1919
732.	Bronx Farms Co., Inc., waste water and washings	July 29, 1918	Nov. 19, 1919
734.	Brooklyn State Hospital, Creedmore Division	Dec. 27, 1918	April 10, 1919
760.	Canisteo Tanning Co., Inc., wastes	Nov. 27, 1918	Jan. 9, 1919
761.	City of Newburgh, sewer in Norton and other streets	Oct. 30, 1918	Jan. 2, 1919
762.	Beakes Dairy Co., waste water and washings	Dec. 31, 1918	June 5, 1919
763.	Fulton County Tuberculosis Hospital, sewage disposal	Dec. 16, 1918	Jan. 29, 1919
764.	South Argyle Dairy Association, wastes and washings	Jan. 17, 1919	Mar. 8, 1919
765.	N. Y. State School of Agriculture, Morrisville, sewage disposal works	Jan. 21, 1919	Feb. 13, 1919
766.	City of Oneonta, sewage disposal works	Feb. 11, 1919	Mar. 28, 1919
767	City of Binghamton, sewer extension in Grand boulevard	Feb. 20, 1919	Mar. 8, 1919
768.	Town of Hyde Park, School District No. 1, sewage disposal	Feb. 20, 1919	April 24, 1919
769.	Berkshire Industrial Farm, sewage disposal	Feb. 28, 1919	Dec. 1, 1919
770.	City of Binghamton, extension in Morgan and other streets	Mar. 11, 1919	Mar. 28, 1919
771.	Village of Massena, extension of outfall sewer	Mar. 11, 1919	Mar. 24, 1919
772.	Frank Walter, settling tank to treat sewage	Mar. 18, 1919	May 7, 1919
773.	Village of Gowanda, amended plans for sewage and sewage disposal	Mar. 28, 1919	April 18, 1919
774.	Liberty Starters Corp., settling tank	April 2, 1919	April 10, 1919
775.	Village of Bronxville, extension in Kensington road	April 2, 1919	April 10, 1919
776.	Burt Olney Canning Company, wastes disposal	April 2, 1919	May 10, 1919
777.	Village of Port Chester, sewer in Elm street	April 11, 1919	April 25, 1919
778.	City of Binghamton, sewers in Andrews avenue and Frederick street	April 16, 1919	April 29, 1919
779.	Village of Baldwinsville, sewer in Canton and Seneca streets	April 17, 1919	*Dec. 2, 1919
780.	City of Salamanca, sewers in Washington and other streets	April 19, 1919	April 25, 1919
781.	J. H. Muller, Munnsville, creamery wastes	May 1, 1919	Dec. 15, 1919
782.	Borden's Farm Products Company, wastes	May 5, 1919	June 5, 1919
783.	Village of Tuckahoe, sewers in various streets	May 8, 1919	May 21, 1919
784.	Dolfinger's Standard Dairies, Nunda, wastes	May 8, 1919	Sept. 5, 1919
785.	Town of Worcester, School District No. 6, disposal plant	May 10, 1919	Cancelled
786.	Village of Mt. Kisco, reconstruction of portions of outfall sewer	May 16, 1919	Dec. 15, 1919

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* Disapproved.

No.	Applicant	Approved by State Department of Health	Approved by Conservation Commission
787.	Town of Elmira, School District No. 6, sewage disposal	May 21, 1919	June 30, 1919
788.	City of Binghamton, sewer in Abbott and other streets	June 5, 1919	June 24, 1919
789.	Town of Southampton, School District No. 17, sewage disposal	June 5, 1919	June 24, 1919
790.	Artificial Silk Company of America, sewage and wastes	June 5, 1919	June 24, 1919
791.	Edward E. Whitford, settling tank	June 6, 1919	June 24, 1919
792.	Village of Mt. Kisco, extension in Hyatt avenue and other streets	June 20, 1919	July 26, 1919
793.	City of Auburn, sludge pipe	June 20, 1919	Nov. 7, 1919
794.	City of Watertown, sewers in Morrison and other streets	June 20, 1919	July 26, 1919
795.	Dolfinger's Standard Dairy, Tuscarora, wastes	June 17, 1919	July 26, 1919
796.	City of Rochester, outfall sewers and sewage disposal	July 3, 1919	July 26, 1919
797.	City of Ogdensburg, extension in Green street	July 3, 1919	July 26, 1919
798.	City of Utica, N. Genesee and other streets	July 9, 1919	July 26, 1919
799.	Broadalbin Knitting Company, Broadalbin, wastes and sewage	July 16, 1919	July 30, 1919
800.	Village of Port Chester, sludge bed	July 22, 1919	Aug. 13, 1919
801.	Ramapo Ore Company, Lakeville, sewage disposal works	July 22, 1919	Aug. 6, 1919
802.	Garner Print Works and Bleachery, Gainesville, sewage disposal works	July 22, 1919	Aug. 4, 1919
803.	Potsdam School District No. 8, sewage disposal works	July 24, 1919	Sept. 12, 1919
804.	City of Binghamton, Emma street sewer	July 23, 1919	Aug. 6, 1919
805.	Reder Bros., Inc., milk station at Fairhaven	July 28, 1919	Oct. 30, 1919
806.	City of New Rochelle, North Avenue School, disposal works	July 30, 1919	Aug. 13, 1919
807.	Yager and Halstead, Inc., Interlaken, disposal, canning factory	Aug. 7, 1919	Dec. 15, 1919
808.	Town of Easthampton, School District No. 3, disposal plant	Aug. 7, 1919	Aug. 29, 1919
809.	Town of Brighton, Sewer District No. 1, sewerage and pumping station	Aug. 12, 1919	Aug. 28, 1919
810.	Grandview-on-Hudson, Henry street settlement, disposal	Aug. 12, 1919	Sept. 2, 1919
811.	City of Ogdensburg, King street	Aug. 18, 1919	Aug. 20, 1919
812.	Town of Union, Common School No. 2, Hooper, disposal	Aug. 18, 1919	Oct. 17, 1919
813.	Binghamton State Hospital, sewage pumping station	July 31, 1919	Aug. 28, 1919
814.	W. E. Fairbanks, creamery at Hermon, wastes	Sept. 5, 1919	Oct. 30, 1919
815.	Towns of Hillsdale and Copake, School District No. 1, disposal	Sept. 5, 1919	Sept. 30, 1919

No.	Applicant	Approved by State Department of Health	Approved by Conservation Commission
816.	Red Creek, School House, disposal	Sept. 11, 1919	Oct. 15, 1919
817.	Ripley Dairy Products Company, Ripley, disposal	Sept. 11, 1919	Dec. 5, 1919
818.	Worcester, School No. 6, disposal	Sept. 11, 1919	Sept. 30, 1919
819.	City of Watertown, Scio street	Sept. 11, 1919	Oct. 7, 1919
820.	Town of West Seneca, Sewer District No. 2, sewerage	Aug. 9, 1919	Oct. 17, 1919
821.	Letchworth Village, chlorination	Sept. 29, 1919	Oct. 17, 1919
822.	Town of Ramapo, Hillburn School, disposal	Oct. 2, 1919	Nov. 19, 1919
823.	Town of Southold, Peconic School, disposal	Oct. 2, 1919	Nov. 11, 1919
824.	City of Ogdensburg, Cherry, Clark and DeViller streets	Oct. 2, 1919	Oct. 17, 1919
825.	Village of Kenmore, Hoover avenue	Oct. 6, 1919	Oct. 30, 1919
826.	City of Ogdensburg, between Main and King streets	Oct. 8, 1919	Oct. 30, 1919
827.	F. W. Knapp and others, Marcellus, sewerage	Oct. 17, 1919	Dec. 15, 1919
828.	Town of Rotterdam, School in District No. 8, disposal	Oct. 17, 1919	Dec. 1, 1919
829.	State of New York, School of Agriculture, Delhi, disposal	Oct. 28, 1919	Nov. 19, 1919
830.	Towns of Dickenson and Fenton, Common School District No. 1, disposal, school at Port Dickenson	Oct. 29, 1919	Dec. 15, 1919
831.	New York City, Farm Colony for Women Offenders, Greycourt, disposal	Oct. 30, 1919	Nov. 19, 1919
832.	Town of Marcellus, District No. 2, sewer for school at Marcellus	Oct. 30, 1919	Nov. 19, 1919
833.	Schule's Pure Grape Juice Company, Inc., disposal wastes	Nov. 10, 1919	Dec. 15, 1919
834.	City of Ogdensburg, David street sewer	Nov. 14, 1919	Dec. 1, 1919
835.	J. H. Benz, Hotel near Rochester, disposal	Nov. 14, 1919	Pending
836.	Town of Colonie, School District No. 13, Newtonville, disposal	Nov. 17, 1919	Dec. 15, 1919
837.	Leake & Watts Orphan House, Tivoli, disposal	Nov. 29, 1919	Dec. 31, 1919
838.	John Cunningham, Rossie, wastes from cheese factory	Nov. 29, 1919	Dec. 15, 1919
839.	T. T. P. Luquer, Bedford Hills, disposal for residence	Dec. 4, 1919	Dec. 19, 1919
840	Village of Larchmont, Iden avenue, Wakeman place, etc	Dec. 4, 1919	Pending
841.	Village of Hamburg. sewerage and disposal	Dec. 6, 1919	Superseded by No. 858
842.	Village of Union, sewerage	Dec. 9, 1919	Pending
843.	Merrell-Soule Company, Farmersville, wastes from Creamery	Dec. 9, 1919	Pending
844.	Village of Bronxville, Granger property and New Rochelle road	Dec. 15, 1919	Dec. 31, 1919
845.	C. R. Hendrix, residence at Mamaroneck	Dec. 19, 1919	Pending

APPENDIX B

PROGRESS REPORT ON HYDROGRAPHIC INVESTIGATIONS CARRIED ON IN COOPERATION WITH THE UNITED STATES GEOLOGICAL SURVEY

DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY
WATER RESOURCES BRANCH

ALBANY, *N. Y., March* 25, 1920.

HON. GEORGE D. PRATT, *Commissioner, State of New York Conservation Commission, Albany, N. Y.:*

DEAR SIR.—Transmitted herewith is a report on the hydrometric work carried on by the United States Geological Survey in co-operation with the State of New York for the water year ending September 30, 1919.

The work has been done in co-operation with your department and with the State Engineer and Surveyor, under the general supervision of Mr. N. C. Grover, chief hydraulic engineer, and Mr. John C. Hoyt, engineer in charge of the division of waters for the Geological Survey.

The accompanying report was prepared under my direction by O. W. Hartwell, engineer, assisted by Max H. Carson and A. H. Davison, assistant engineers, B. F. Howe and Otto Lauterhahn, junior engineers, and Gertrude E Shaw, clerk.

Acknowledgments are due engineers of the division of waters of your department, and engineers of the bureau of hydraulics of the State Engineer's office, for assistance rendered in field and office.

Very truly yours,

C. C. COVERT,
District Engineer.

PROGRESS REPORT ON HYDROMETRIC WORK CARRIED ON BY THE UNITED STATES GEOLOGICAL SURVEY IN CO-OPERATION WITH THE STATE OF NEW YORK

GENERAL STATEMENT

With practically no interruptions because of ice conditions, extreme floods, or very low flows, the records published herewith for the climatic year ending September 30, 1919, form somewhat of a contrast over previous reports. Discharge measurements made during the winter months indicated very clearly that in many cases the ice obstruction was not sufficient to warrant any correction for backwater. Those streams where backwater conditions were evident were few, and the period of such disturbance was very short, averaging perhaps not over two or three weeks.

Scope of Work

The records published in this report do not cover the entire State. They are, however, as complete as the appropriations available for the investigations will allow. The number of stations maintained during the current year was slightly greater than during the previous year. The new stations were made possible because of co-operation on the part of power companies and favorable climatic conditions mentioned above. Only for these facts, it would have been necessary to have reduced the number of stations materially because of the increased cost of the work both in field and office.

Appropriations for this work are made to cover the State and Federal fiscal year which ends with June. Because of climatic conditions in the district and throughout the United States, it has been considered advisable by those in charge of the Geological Survey to publish the annual reports on the basis of a climatic year, and September 30 has been chosen as the ending of this period because in most of the districts this season was found to be approximately the end of the dry season and the beginning of the wet season. Especially is this true in the northern districts where ice conditions prevail. This arrangement of the climatic season also permits of carrying the entire winter months through in one report.

The report contains records of daily and monthly discharge for 50 stations, giving a total of nearly 600 months' records, or an average of about 12 months' records per station per year. There were 322 discharge measurements made, or an average of 5.5 measurements per station of 12 months' records. The total cost per station was approximately $313.00.

Since the appropriations are made to cover the fiscal year, cost data is worked up on that basis. The following items for appropriations and expenditures refer therefore to the fiscal year ending June 30, 1919, rather than to the climatic year.

Appropriations

State of New York Conservation Commission....	$10,000 00
State Engineer and Surveyor..................	2,500 00
United States Geological Survey...............	4,000 00

Expenditures

State of New York Conservation Commission....	$8,630 31
State Engineer and Surveyor..................	2,377 93
United States Geological Survey...............	4,108 00
Outside Contributions	635 26

Principal Items of Cost

Observers' Pay	$2,137 95
Operation and Maintenance	4,314 92
Construction...............................	337 90
Office Work	4,907 87
Top Cost	4,052 86

HUDSON RIVER AT GOOLEY NEAR INDIAN LAKE

Location.—About a mile below mouth of Cedar River, 1½ miles above mouth of Indian River and six miles northeast of Indian Lake village, Hamilton County.

Drainage area.— 418 square miles (measured on topographic maps).

Records available.—August 30, 1916, to September 30, 1919.

Gage.— Gurley printing water-stage recorder on right bank. Inspected by John A. Bolton.

Discharge measurements.— Made by wading or from cable about 100 yards below gage.

Channel and control.— Solid ledge overlain with coarse gravel; probably permanent.

Extremes of discharge.— Maximum stage during year, from water-stage recorder, 8.7 feet from 2 to 4 P. M. April 12 (discharge 10,400 second-feet); minimum stage recorded, from water-stage recorder, 1.5 feet at noon August 17 (discharge 73 second-feet).

1916–1919: Maximum stage recorded, from water-stage recorder, 9.87 feet at 11 A. M. June 12, 1917 (discharge 13,500 second-feet); minimum stage, from water-stage recorder, 1.43 feet from 11 A. M. September 11 to 8 A. M. September 13, 1916 (discharge 56 second-feet).

Ice.— Stage-discharge relation affected by ice.

Regulation.— Large diurnal fluctuation due to logging operations during spring months. Seasonal distribution of flow slightly affected by storage.

Accuracy.— Stage-discharge relation practically permanent; usually affected by ice from December to April and by backwater from logs June to September. Rating curve fairly well defined between 75 and 600 second-feet and well defined between 600 and 6,000 second-feet. Operation of water-stage recorder satisfactory. Daily discharge ascertained by applying mean daily gage height to rating table except when fluctuation required mean of hourly discharge. Records good.

Discharge measurements of Hudson River at Gooley near Indian Lake, during the year ending September 30, 1919

Date	Made by	Gage height	Discharge
		Feet	*Sec.-ft.*
Oct. 25 *a*	E. D. Burchard	3.12	956
Jan. 14 *b*	do	2.94	389
Feb. 12 *b*	do	2.47	240
Mar. 12 *b*	J. W. Moulton	3.64	585
April 5	M. H. Carson	3.29	1,160
May 8	do	4.70	2,920
8	do	5.59	4,100
June 19	C. C. Covert	2.46	495

a A few logs on control.
b Ice on control.

Daily discharge, in second-feet, of Hudson River at Gooley near Indian Lake, for the year ending September 30, 1919

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1	1,100	2,480	850	800	300	240	1,500	*a*	1,150	280	234	224
2	932	2,600	750	700	280	260	1,200	*a*	665	180	207	224
3	810	2,220	700	700	280	280	1,000	*a*	488	207	175	247
4	735	1,750	600	650	280	300	800	*a*	416	143	164	229
5	735	1,440	550	600	240	280	1,000	*a*	399	104	153	247
6	772	1,240	562	550	240	360	1,290	*a*	372	187	160	220
7	1,120	1,060	735	550	240	460	1,750	*a*	491	267	211	183
8	3,490	932	772	500	240	440	2,470	*a*	700	282	167	167
9	3,660	810	735	480	240	420	2,510	1,630	630	179	142	700
10	2,600	772	630	440	240	480	3,360	1,770	476	202	132	1,150
11	1,860	772	665	400	200	550	5,250	*b*	394	428	109	1,200
12	1,540	772	850	380	220	550	9,490	*b*	367	361	108	1,020
13	1,340	700	890	380	200	500	6,400	*b*	336	290	90	890
14	1,340	665	700	380	200	500	5,270	*b*	315	242	82	700
15	1,060	630	595	360	220	420	2,830	4,010	367	252	82	595
16	777	562	975	400	240	400	2,960	4,210	508	346	82	488
17	595	530	1,060	500	220	400	4,000	1,930	772	399	80	405
18	530	595	1,100	380	260	460	2,750	2,100	735	394	100	336
19	506	1,200	1,290	280	240	900	2,000	2,700	506	320	200	285
20	494	1,800	1,290	320	220	1,100	1,890	1,930	388	259	200	261
21	476	1,920	850	260	220	1,100	2,820	1,560	325	235	190	252
22	562	1,700	665	220	220	1,000	1,560	1,620	524	261	170	280
23	824	1,390	890	180	220	950	1,160	2,760	665	266	157	388
24	1,240	1,100	1,290	280	240	800	1,650	3,780	512	252	157	530
25	1,200	890	1,340	600	260	650	1,740	*c*	305	247	224	530
26	975	735	1,390	600	280	600	3,390	*c*	234	224	229	494
27	890	630	1,240	480	280	700	1,470	*c*	382	238	207	434
28	975	562	1,150	400	260	1,600	1,360	*c*	470	295	183	378
29	1,060	750	1,020	340	......	1,100	2,520	*c*	351	305	179	330
30	975	900	950	320	......	2,400	2,100	*c*	310	285	179	295
31	1,060	......	850	300	......	1,900	......	*c*	......	261	211	......

NOTE. — Stage-discharge relation affected by ice December 30 to March 30. Daily discharge for this period is approximate. Daily discharge estimated October 1, November 29 to December 5; March 31 to April 5; April 30, May 18, 19, June 1, July 4, 5, 20 and 21.

Estimated mean daily discharge 2,000 second-feet May 1–8; 1,100 second-feet May 11–14; 2,200 second-feet May 25–31.

Discharge estimated by comparing with hydrograph of Hudson at North Creek minus Indian, Indian Lake.

a Mean estimated 2,000 *b* Mean estimated 1,100. *c* Mean estimated 2,200.

Monthly discharge of Hudson River at Gooley near Indian Lake, for the year ending September 30, 1919
[Drainage area, 418 square miles]

MONTH	DISCHARGE IN SECOND-FEET				RUN-OFF
	Maximum	Minimum	Mean	Per square mile	Depth in inches on drainage area
October	3,660	476	1,170	2.80	3.23
November	2,600	530	1,140	2.73	3.05
December	1,390	550	901	2.16	2.49
January	800	180	443	1.06	1.22
February	300	200	241	.577	.60
March	2,400	240	713	1.71	1.97
April	9,490	800	2,650	6.34	7.07
May	....	....	2,120	5.07	5.84
June	1,150	234	485	1.16	1.29
July	428	104	264	.632	.73
August	234	80	160	.383	.44
September	1,200	167	456	1.09	1.22
The year	9,490	80	897	2.15	29.15

HUDSON RIVER AT NORTH CREEK

Location.—At two-span steel highway bridge in village of North Creek, Warren County, immediately above mouth of North Creek.

Drainage area.— 804 square miles.

Records available.— September 21, 1907, to September 30, 1919.

Gage.— Chain at upstream side of left span of the bridge; read by William Alexander.

Discharge measurements.— Made from the upstream side of the highway bridge.

Channel and control.— Heavy gravel; fairly permanent.

Extremes of discharge.— Maximum stage recorded during year, 8.5 feet at 7:30 A. M. April 12 (discharge about 13,800 second-feet); minimum stage recorded 2.25 feet, at 8 A. M. July 6, and 6 P. M. September 6 (discharge 302 second-feet).

1907–1919: Maximum stage recorded, 12.0 feet, during the evening of March 27, 1913 (discharge, about 30,000 second-feet); minimum stage, 2.05 feet, at 7:05 A. M. September 30, 1913 (discharge, 168 second-feet).

Ice.— Stage-discharge relation affected by ice.

Regulation.— The numerous lakes and ponds in the basin of the upper Hudson have a decided effect on the low water flow, especially the reservoir at Indian Lake. Many of the reservoirs are used to make flood waves in the spring in connection with log driving.

Accuracy.— Stage-discharge relation practically permanent; usually affected by ice from December to March. Rating curve well defined between 250 and 6,000 second-feet. Gage read to half tenths twice daily. Daily discharge ascertained by applying mean daily gage height to rating table. Open-water records good; winter records fair, affected by ice.

Discharge measurements of Hudson River at North Creek, during the year ending September 30, 1919

Date	Made by	Gage height	Discharge
		Feet	*Sec.-ft.*
Jan. 14	E. D. Burchard	2.75	665
Feb. 10 *a*	do	3.31	1,160
May 9	O. W. Hartwell	5.46	4,790
9	do	4.59	3,280

a A little shore ice on control.

Daily discharge, in second-feet, of Hudson River at North Creek, for the year ending September 30, 1919

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1	1,220	4,010	1,350	1,100	1,100	1,100	3,050	3,230	2,370	610	423	940
2	1,100	3,230	1,220	1,040	1,100	1,160	2,530	1,350	1,620	530	390	1,100
3	1,160	2,700	1,100	1,350	1,100	1,220	2,210	2,870	1,840	342	360	990
4	940	2,700	1,100	1,160	1,040	1,420	2,060	2,530	990	330	330	530
5	940	2,210	990	990	990	1,350	1,760	4,440	700	330	330	342
6	1,420	1,480	890	990	990	1,220	1,760	5,120	610	446	655	330
7	4,440	1,220	790	890	1,160	990	3,230	2,140	700	610	610	610
8	4,660	1,220	790	890	1,350	990	4,010	5,360	990	610	610	745
9	3,420	1,160	745	790	1,350	990	3,810	4,440	890	570	530	2,060
10	2,210	1,100	700	700	1,350	990	5,120	3,230	790	655	790	2,370
11	1,910	1,100	700	745	1,160	1,040	9,100	1,690	610	1,100	700	1,910
12	1,620	1,100	700	700	1,220	990	13,400	1,840	530	745	610	1,480
13	1,480	990	700	700	1,220	940	8,240	1,760	530	530	840	1,280
14	1,350	890	700	655	1,160	790	5,360	2,060	530	425	890	1,100
15	1,100	840	840	700	1,220	790	4,010	1,910	700	390	790	840
16	1,160	790	1,220	700	1,160	745	4,660	3,230	790	610	790	700
17	1,100	745	1,220	890	1,100	745	7,400	2,210	1,480	610	890	610
18	1,100	890	1,100	790	1,160	745	5,840	2,870	1,100	610	1,040	700
19	990	2,060	1,100	610	1,160	1,350	3,230	3,230	940	530	1,100	790
20	990	2,700	990	610	1,160	1,760	2,870	2,870	700	495	1,160	790
21	890	2,700	990	745	1,220	2,210	3,610	2,530	610	460	1,100	890
22	1,100	2,530	990	1,100	1,100	3,230	3,810	3,420	700	530	840	1,160
23	1,350	2,060	1,100	1,220	1,040	3,230	3,610	5,600	700	530	530	1,220
24	1,420	1,690	1,910	1,350	1,100	3,420	3,610	6,600	790	460	790	890
25	1,220	1,480	1,980	1,620	1,220	2,870	2,870	5,600	610	460	1,160	790
26	1,100	1,220	1,980	1,760	1,100	2,630	3,810	4,840	655	425	1,220	700
7	1,100	1,100	1,760	1,480	1,040	3,810	2,870	5,360	745	404	1,100	610
28	1,350	1,100	1,350	1,480	1,100	5,360	2,700	3,420	1,040	530	890	790
29	1,350	1,100	1,220	1,350	......	5,360	4,220	2,530	700	530	790	840
20	1,280	1,350	1,160	1,220	......	5,120	3,230	2,210	610	530	700	745
31	3,420	......	1,100	1,160	......	4,010	......	1,760	......	446	700	......

NOTE.— Stage-discharge relation not affected by ice.

Monthly discharge of Hudson River at North Creek, for the year ending September 30, 1919
[Drainage area, 804 square miles]

MONTH	DISCHARGE IN SECOND-FEET				RUN-OFF
	Maximum	Minimum	Mean	Per square mile	Depth in inches on drainage area
October	4,660	890	1,610	2.00	2.31
November	4,010	745	1,650	2.05	2.29
December	1,980	700	1,110	1.38	1.59
January	1,760	610	1,020	1.27	1.46
February	1,350	990	1,150	1.43	1.49
March	5,360	745	2,020	2.51	2.89
April	13,400	1,760	4,270	5.32	5.94
May	6,600	1,350	3,300	4.10	4.73
June	2,370	530	886	1.10	1.23
July	1,100	330	528	.657	.76
August	1,220	330	763	.949	1.09
September	2,370	330	962	1.20	1.34
The year	13,400	330	1,610	2.00	27.12

HUDSON RIVER AT THURMAN

Location.— At Delaware & Hudson Railroad bridge near Thurman railroad station, Warren County, about half a mile below mouth of Schroon River and 13 miles above mouth of Sacandaga River.

Drainage area.— 1,550 square miles.

Records available.— September 1, 1907, to September 30, 1919.

Gage.— Chain at upstream side near center of left span; read by S. H. Spencer.

Discharge measurements.— Made from upstream side of bridge.

Channel and control.— Bed composed of sand and gravel; fairly permanent.

Extremes of discharge.— Maximum stage recorded during year 8.25 feet at 9 A. M. April 12 (discharge 18,600 second-feet); minimum stage recorded 2.2 feet at 9 A. M. August 3 (discharge 460 second-feet).

1907 1919: Maximum stage, 12.5 feet, during late evening March 27, 1913, determined by leveling from flood marks (discharge about 46,000 second-feet); minimum stage recorded 2.12 feet, at 8:55 A. M. and 6:20 P. M., September 30, 1913 (discharge about 290 second-feet).

Ice.— Stage-discharge relation affected by ice. Winter discharge determined from records at North Creek and Riverbank.

Regulation.— Discharge is regulated to some extent by the storage reservoirs at Indian Lake and Schroon Lake and the mills on the Schroon River.

Accuracy.— Stage-discharge relation practically permanent; usually affected by ice during large part of the period from December to March, inclusive. Rating curve well defined between 550 and 20,000 second-feet. Gage read to hundredths twice daily. Daily discharge ascertained by applying mean daily gage height to rating table. Records good. Estimated discharge during ice period fair.

Cooperation.— Gage heights furnished by the International Paper Co.

Discharge measurements of Hudson River at Thurman, during the year ending September 30, 1919

DATE	Made by	Gage height	Discharge
		Feet	*Sec.-ft.*
Oct. 26	E. D. Burchard	3.41	1,980
Nov. 15	do	3.38	2,030
Feb. 13 *a*	do	4.75	1,470
Mar. 13 *b*	J. W. Moulton	4.12	2,050
May 10	M. H. Carson	4.43	4,460
Aug. 14	C. C. Covert	2.93	1,180
Sept. 5	M. H. Carson	2.39	584
5	do	2.33	576

a Nearly complete ice cover on control.
b Partial ice cover on control.

Daily discharge, in second-feet, of Hudson River at Thurman, N. Y., for the year ending Sept. 30, 1919

DAY	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1	2,010	6,460	2,780	2,120	......	......	6,780	3,610	3,360	1,280	1,060	1,130
2	1,530	5,540	2,440	2,660	......	......	5,840	3,120	3,240	1,200	1,000	1,620
3	1,280	4,950	2,440	2,550	......	......	5,540	3,610	2,660	1,000	460	1,440
4	1,360	4,390	2,440	2,550	......	......	5,840	3,860	2,660	880	880	1,280
5	1,440	4,120	2,220	2,010	......	......	4,670	8,440	2,010	735	880	610
6	1,720	3,610	2,010	......	......	......	4,670	5,540	1,440	780	940	530
7	4,120	3,240	2,120	......	......	......	6,150	5,240	1,360	1,280	830	735
8	6,460	3,000	2,010	......	......	......	6,780	4,670	1,620	1,280	880	880
9	5,240	2,660	1,810	......	......	......	7,760	8,440	2,120	1,000	940	2,220
10	3,860	2,440	1,810	......	......	......	8,790	3,860	2,010	1,000	690	3,120
11	3,000	2,440	1,720	......	......	......	11,000	3,360	1,810	2,010	1,060	3,120
12	2,780	2,120	1,620	......	......	......	18,400	5,540	1,720	1,810	940	2,330
13	2,780	1,910	2,010	......	......	......	13,300	3,860	1,530	780	1,000	2,010
14	2,550	1,910	1,910	......	......	......	11,400	4,390	1,810	780	1,130	2,010
15	2,220	1,810	2,330	......	......	......	9,500	3,360	1,360	940	1,000	1,440
16	1,360	1,910	2,440	......	......	......	8,440	3,860	1,620	1,130	1,000	1,280
17	1,280	1,810	2,660	......	......	......	9,500	3,610	2,890	1,280	1,060	1,280
18	1,810	1,910	2,440	......	......	......	10,200	5,540	2,220	1,280	1,280	1,130
19	1,440	4,120	2,010	......	......	......	7,430	6,460	2,010	1,280	1,360	1,280
20	1,360	4,670	1,910	......	......	......	5,840	5,540	1,910	780	1,620	1,280
21	1,200	4,950	1,810	......	......	......	6,460	4,950	1,530	1,200	1,620	1,200
22	1,530	4,670	1,910	......	......	......	6,150	5,540	1,440	1,280	1,440	1,280
23	1,810	4,120	2,220	......	......	......	5,540	9,140	1,440	1,530	940	1,720
24	2,220	3,860	2,890	......	......	......	5,840	10,200	1,440	1,280	940	1,810
25	2,220	3,360	2,890	......	......	......	3,860	9,500	1,440	1,280	1,620	1,280
26	2,120	3,000	3,360	......	......	......	5,240	8,790	1,130	1,280	1,720	1,200
27	1,910	2,660	3,360	......	......	......	5,240	9,140	1,910	1,000	1,530	1,130
28	2,120	2,550	3,000	......	......	......	4,950	7,430	1,720	1,280	1,130	1,130
29	2,120	2,550	2,330	......	......	......	5,840	5,540	1,440	1,200	1,000	1,200
30	2,220	2,660	2,220	......	......	......	4,390	4,950	1,280	1,130	1,000	1,200
31	4,950	......	1,810	......	......	......	......	4,120	......	1,200	1,060	......

NOTE.— Stage-discharge relation affected by ice January 6, to March 31.
Mean discharge for this period determined by comparison with sum of records at North Creek and Riverbank.

Monthly discharge of Hudson River at Thurman, for the year ending September 30, 1919
[Drainage area, 1,550 square miles]

MONTH	DISCHARGE IN SECOND-FEET				RUN-OFF
	Maximum	Minimum	Mean	Per square mile	Depth in inches on drainage area
October	6,460	1,200	2,390	1.54	1.78
November	6,460	1,810	3,310	2.14	2.39
December	3,360	1,620	2,290	1.48	1.71
January	....	....	1,960	1.26	1.45
February	....	....	1,710	1.10	1.14
March	....	....	3,950	2.55	2.94
April	18,400	3,860	7,380	4.76	5.31
May	10,200	3,120	5,650	3.65	4.21
June	3,360	1,130	1,870	1.21	1.35
July	2,010	735	1,170	.755	.87
August	1,720	460	1,100	.710	.82
September	3,120	530	1,460	.942	1.05
The year	18,400	460	2,860	1.85	25.02

HUDSON RIVER AT SPIER FALLS

Location.— Half a mile below Spier Falls dam, Saratoga County, and 11½ miles below mouth of Sacandaga River.

Drainage area.— 2,800 square miles (measured on topographic maps).

Records available.— October 7, 1912, to September 30, 1919.

Gage.— Gurley 2-day water stage recorder in brick shelter 5 feet square on the right bank. Recorder inspected by T. F. Malone, chief operator of power plant.

Discharge measurements.— Made from a cable about 1,000 feet downstream from the gage.

Channel and control.— Bed composed of coarse gravel and boulders. Control probably permanent.

Extremes of discharge.— Maximum stage during year, from water stage recorder, 11.64 feet at 1:00 A. M. and 6:00 A. M. April 13 (discharge 32,000 second-feet); minimum stage, 0.99 feet at 4 A. M. and 5 A. M. August 16 (discharge 155 second-feet).

1912–1919: Maximum stage from water stage recorder, 18.59 feet, at 12:25 A. M. March 28, 1913 (discharge about 89,100 second-feet); minimum stage, minus 0.12 feet at 4 P. M. September 23, 1917, observed during current meter measurement (discharge about 5.5 second-feet).

Ice.— Stage-discharge relation not affected by ice except for a short time during extremely cold periods.

Regulation.— Large diurnal fluctuation in discharge due to operation of the Spier Falls power plant. Seasonal flow affected by storage at Indian Lake and many small lakes and reservoirs in the upper part of the drainage basin.

Accuracy.— Stage-discharge relation practically permanent; rating curve well defined for all stages except about 9 feet, where curve may be 4 per cent or 5 per cent large. Operation of the water-stage recorder satisfactory throughout the year. Daily discharge ascertained by averaging the results obtained by applying gage heights for one-hour intervals to the rating table. Records good.

Co-operation.—Water-stage recorder inspected by an employee of the Adirondack Electric Power Corporation.

Discharge measurements of Hudson River at Spier Falls during the year ending September 30, 1919

DATE	Made by	Gage height	Discharge
		Feet	*Sec.-ft.*
May 11........	O. W. Hartwell....................................	5.99	8,380

Daily discharge, in second-feet, of Hudson River at Spier Falls, for the year ending Sept. 30, 1919

DAY	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1.....	4,070	12,600	4,940	5,230	3,190	2,070	15,700	7,480	5,900	2,700	1,950	2,000
2.....	3,700	12,200	4,610	6,080	2,810	3,790	13,200	8,500	6,280	2,780	2,560	3,290
3.....	2,780	11,000	3,860	6,570	3,230	4,150	11,300	9,120	4,480	2,730	878	2,950
4.....	3,290	9,730	4,170	6,480	2,890	4,250	10,400	9,880	4,220	1,000	1,660	2,810
5.....	2,750	8.570	4,020	4,480	2.860	5 030	9,680	12,000	3,910	1,080	1,430	2,440
6......	2,210	7,510	3,700	3,980	2,980	5,530	9,810	11,400	2,760	839	1,350	1,950
7......	4,810	6,430	2,670	3,810	2,990	5,350	11,600	12,600	2,310	1,990	1,010	900
8......	8,320	6,240	1,670	4,050	2,180	5,070	13,700	9,230	1,640	2,310	1,470	2,200
9......	7,340	4,620	4,280	4,030	2,160	5,570	15,600	13,500	3,170	1,950	1,700	3,010
10......	5,900	4 430	2 700	3.900	3,420	7,820	16,200	9,150	3,080	2,220	832	3,770
11......	4,500	4,420	2,980	3,150	2,660	7,820	19,800	8,900	3,080	3,230	1,580	4,660
12......	4,100	5,250	2,420	2,900	2.270	7 210	29 400	9,530	3,060	2,840	1,800	4,600
13......	3,780	3,770	2,940	3,240	2,330	7,320	30,900	9,910	2,650	2,940	1,430	3,890
14......	3,960	3,490	3,400	2,250	2,540	6,200	26,700	9,290	2,360	3,230	1,400	2,050
15......	3,480	3,230	3,500	3,040	2,120	5,500	22,100	9,040	1,390	2,180	1,790	3,510
16......	2,920	3,500	5,380	2,820	1,710	4,990	18,000	8,350	3,190	1,540	1,490	2,120
17......	2,440	2,730	5,720	3,200	3,240	4,760	18,800	8,400	3,370	2,360	920	1,950
18......	2,310	3,940	5,250	3,010	2,740	5,230	18,700	9,420	3,830	3,010	2,160	2,020
19......	2,460	7,600	4,680	2,700	2,430	7,600	15,400	11,300	3,310	2,260	1,700	2,020
20......	1,620	9,700	4,230	2,500	2,170	9,080	14,300	10,500	3,000	1,040	2,420	1,990
21......	2,470	9,770	3,400	2,300	2,720	11,200	12,700	9,260	2,460	1,800	3,010	1,440
22......	3,590	8,960	3,410	2,640	1,700	13,500	12,600	10,700	1,820	3,000	2,880	2,740
23......	3,630	7,940	5,500	2,850	1,400	13,900	9,780	16,300	2,760	3,580	1,870	2,920
24......	4,370	6,910	6,700	4,040	2,740	14,400	10,100	18,100	2,100	3,100	722	3,340
25......	3,740	6,060	9,290	4,700	2,300	14,800	8,940	18,500	1,920	2,190	2,160	3,490
26.....	4,050	5,190	12,100	5,030	2,230	13,200	9,420	16,700	1,860	1,900	2,460	3,500
27......	2,300	4,760	11,500	5,020	2,390	13,100	9,270	16,200	2,280	905	2,800	2,120
28......	4,130	3,260	9,900	4,670	2,340	21,200	7,620	13,600	2,780	2,360	1,800	1,420
29......	3,740	4,580	8,240	4,200	......	20,300	8,430	10,900	3,800	3,100	2,370	2,980
30......	4,240	4,720	6,640	3,940	......	20,000	7,790	8,640	3,140	2,520	2,180	2,010
31......	7,230	......	5,240	3,680	......	18,300	......	7,340	......	2,150	738	......

Monthly discharge of Hudson River at Spier Falls, for the year ending September 30, 1919.
[Drainage area, 2,800 square miles]

MONTH	DISCHARGE IN SECOND-FEET				RUN-OFF
	Maximum	Minimum	Mean	Per square mile	Depth in inches on drainage area
October..........................	8,320	1,620	3,880	1.38	1.59
November..........................	12,600	2,730	6,440	2.30	2.57
December..........................	12,100	1,670	5,130	1.83	2.11
January..........................	6,570	2,250	3,890	1.39	1.60
February..........................	3,420	1,400	2,530	.904	.94
March..........................	21,200	2,070	9,300	3.32	3.83
April..........................	30,900	7,620	14,600	5.21	5.81
May..........................	18,500	7,340	11,100	3.96	4.56
June..........................	6,280	1,390	3,060	1.09	1.22
July..........................	5,800	160	2,280	.816	.94
August..........................	5,000	155	1,760	.628	.72
September..........................	7,100	160	2,670	.953	1.06
The year..........................	30,900	155	5,560	1.99	26.95

HUDSON RIVER AT MECHANICVILLE

Location.— At Duncan dam of West Virginia Pulp & Paper Co., in Mechanicville, Saratoga County, 3,700 feet above mouth of Anthony Kill, 1¼ miles below mouth of Hoosic River and about 19 miles above mouth of Mohawk River.

Drainage area.— 4,500 square miles.

Records available.— 1888 to September 30, 1919.

Gage.— Water-stage recorder at the dam. Installed in 1910; previous to that date, staff gage.

Computations of Discharge.— Discharge over spillway determined from a rating curve based on coefficients derived by United States Geological Survey for dams of ogee section. Discharge through turbines computed from records of their operation. Discharge at lock and through Barge Canal turbines at lock computed from records of the number of lockages per day.

Extremes of Discharge.— Maximum daily discharge during year 31,600 second-feet, April 13; minimum daily discharge 1,000 second-feet September 1.

1888–1919: Maximum discharge recorded, 120,000 second-feet at 6 A. M. March 28, 1913.[1] The plant is occasionally shut down and the flow of the river stored in the pond so that the discharge below the station occasionally becomes practically zero.

Diversions.— Water is diverted from Hudson River through the Glens Falls Feeder and the old Champlain Canal into the summit level of the Barge Canal. A portion flows north into Lake Champlain. No correction has been made for this diversion.

Cooperation.— Discharge over the spillway and through turbines of the West Virginia Pulp & Paper Co. furnished by Mr. W. J. Barnes, engineer of the company.

Daily discharge, in second-feet, of Hudson River at Mechanicville, for the year ending September 30, 1919

DAY	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1......	6,410	14,400	6,830	8,690	5,000	10,400	14,700	9,340	6,900	3,680	2,620	1,060
2......	5,660	14,800	6,800	13,400	3,580	7,190	12,500	9,990	8,480	2,910	2,110	2,300
3......	4,460	13,300	5,440	11,400	4,770	6,490	11,400	10,100	7,180	2,890	2,080	3,740
4......	4,920	13,100	5,340	10,400	4,450	5,820	11,500	10,300	6,090	1,980	1,740	3,500
5......	4,000	11,600	6,070	7,760	4,210	8,270	11,000	14,400	5,390	2,040	1,840	3,250
6......	3,260	10,300	5,280	6,960	3,670	7,660	10,600	13,400	4,990	1,700	2,040	2,750
7......	4,780	8,460	4,660	6,600	3,980	7,240	12,700	14,400	4,000	1,840	1,590	1,260
8......	9,190	7,660	4,190	6,680	3,710	6,490	14,100	11,700	3,070	2,100	1,410	1,910
9......	8,900	6,890	3,390	6,520	2,280	8,800	14,700	13,700	4,020	2,210	1,420	3,210
10......	7,460	6,280	4,890	6,220	3,150	12,400	14,900	11,800	5,200	2,520	1,450	4,670
11......	6,480	5,870	4,340	5,340	3,760	10,400	17,300	11,800	4,620	3,060	1,330	5,950
12......	5,490	6,380	4,080	4,140	3,300	9,010	27,300	11,300	4,170	4,200	1,680	5,910
13......	4,940	6,190	4,270	4,880	2,890	7,760	31,600	12,200	3,930	1,840	1,750	5,460
14......	4,920	4,380	4,610	4,960	3,040	6,460	29,400	10,800	3,320	3,660	1,860	4,870
15......	4,970	3,770	8,420	4,560	3,480	6,860	23,300	11,000	2,340	3,010	1,350	8,220
16......	4,200	4,620	11,400	4,680	2,160	5,980	20,300	9,840	2,920	2,590	1,820	4,780
17......	3,780	3,520	9,750	4,380	3,280	7,250	20,400	10,700	3,760	2,060	1,220	3,420
18......	3,480	8,320	7,950	4,730	3,540	9,040	20,200	13,800	4,940	1,900	1,400	3,450
19......	3,100	12,200	7,170	3,730	3,380	10,700	17,300	13,800	4,500	3,050	2,370	2,660
20......	1,520	13,400	6,740	4,960	2,790	10,900	15,900	12,500	4,200	1,950	1,880	2,230
21......	3,360	13,100	6,250	4,340	2,510	13,000	13,900	11,600	3,870	1,880	2,720	2,440
22......	4,240	12,200	7,240	4,010	2,800	14,300	13,400	16,600	2,260	2,280	3,130	2,250
23......	4,730	10,800	11,900	4,790	1,840	13,000	11,300	18,600	2,980	5,020	2,960	3,700
24......	5,090	9,860	13,100	8,510	2,590	13,500	11,100	19,300	2,520	4,600	1,540	4,780
25......	4,760	9,570	17,400	7,790	3,300	13,700	10,600	19,600	2,430	3,140	1,390	4,980
26......	5,090	7,800	16,700	7,790	4,690	12,400	10,100	19,000	2,320	3,030	2,330	5,210
27......	4,960	6,910	15,700	8,010	4,010	12,300	11,100	17,200	2,400	1,910	2,520	4,450
28......	4,280	4,880	13,500	7,000	3,920	26,000	9,560	15,600	2,260	1,520	3,160	3,050
29......	5,030	6,660	11,400	6,510	......	21,500	9,150	13,500	2,800	2,360	2,410	2,170
30......	4,790	6,720	9,600	6,140	......	18,500	9,500	10,300	4,440	3,280	2,330	3,780
31......	5,010	......	8,620	5,900	......	16,500	......	9,550	......	2,810	1,730	......

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[1] Highest known flood prior to this time occurred April, 1869; calculated discharge, 70,000 second-feet. See Water-Supply Paper, 65, p. 51, and report of United States Board of Engineers on Deep Waterways, pt. 1, pp. 377–388.

Monthly discharge of Hudson River at Mechanicville, for the year ending September 30, 1919
[Drainage area, 4,500 square miles]

MONTH	DISCHARGE IN SECOND-FEET				RUN-OFF
	Maximum	Minimum	Mean	Per square mile	Depth in inches on drainage area
October	9,190	1,520	4,940	1.10	1.27
November	14,800	3,520	8,800	1.96	2.19
December	17,400	3,390	8,160	1.81	2.09
January	13,400	3,730	6,510	1.45	1.67
February	5,000	1,840	3,430	.762	.79
March	26,000	5,820	11,000	2.44	2.81
April	31,600	9,150	15,400	3.42	3.82
May	19,600	9,340	13,200	2.93	3.38
June	8,480	2,260	4,080	.907	1.01
July	5,020	1,520	2,680	.596	.69
August	3,160	1,220	1,970	.438	.50
September	8,220	1,060	3,710	.824	.92
The year	31,600	1,060	6,990	1.55	21.14

INDIAN LAKE RESERVOIR AT INDIAN LAKE

Location.— At masonry storage dam at outlet of Indian Lake, 2 miles south of Indian Lake village, Hamilton County, and 7½ miles above mouth of Indian River.

Drainage area.— 131 square miles, including about 9.3 square miles of water surface of Indian Lake at the elevation of crest of spillway (measured on topographic maps).

Records available.— Records of stage and gate openings from July, 1900, to September 30, 1919.

Gages.— Elevation of water surface in reservoir is determined by chain gage on the crest of dam near gate house. Gage installed November 17, 1911, to replace staff gage previously maintained at the same point; mean elevation of crest of spillway is at gage height 33.38 feet. Widths of sluice gate openings determined by gage scales at sides of gate stems inside gate house. Gages read by Lester Sevarie.

Extremes of Stage.— Maximum elevation of water surface in reservoir, 35.0 feet May 3 and 4; minimum elevation 19.8 feet March 5.

1900–1919: Maximum elevation recorded, 38.8 feet March 28, 1913; minimum stage recorded, 2.0 feet March 9 to 18, 1907, and January 3 to 17, 1910.

Regulation.— At ordinary stages the discharge is completely regulated by the operation of the sluice gates. Water is held in storage until needed to supplement the flow of the upper Hudson during the low water period. This storage capacity of about 4.7 billion cubic feet provides for a discharge of approximately 600 second-feet for a period of 90 days.

Daily gage height in feet of Indian Lake Reservoir at Indian Lake, for the year ending September 30, 1919

DAY	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1	19.95	22.8	27.25	31.1	29.9	20.8	27.1	34.75	33.65	34.1	33.8	27.55
2	20.0	23.0	27.35	31.3	29.7	20.6	27.3	34.8	33.65	34.1	33.8	27.2
3	20.1	23.2	27.45	31.5	29.5	20.3	27.6	35.0	33.65	34.05	33.8	27.25
4	20.2	23.4	27.55	31.6	29.3	20.0	27.8	35.0	33.65	34.05	33.75	27.3
5	20.3	23.6	27.6	31.7	29.1	19.8	27.9	34.8	33.65	34.0	33.55	27.35
6	20.4	23.8	27.65	31.8	28.85	20.0	28.0	34.6	33.65	33.85	33.45	27.25
7	20.65	24.2	27.7	31.9	28.7	20.2	28.2	34.4	33.65	33.75	33.35	27.05
8	20.8	24.6	27.75	31.95	28.45	20.35	28.65	34.4	33.65	33.6	33.25	26.85
9	20.95	24.5	27.8	32.0	27.6	20.5	29.3	34.4	33.7	33.45	33.1	26.8
10	21.05	24.75	27.9	32.05	27.3	20.75	30.0	34.4	33.7	33.5	33.0	26.6
11	21.1	24.9	27.95	32.1	26.9	20.9	30.8	34.4	33.75	33.55	32.9	26.75
12	20.2	25.2	28.0	32.1	26.5	21.0	32.5	34.35	33.75	33.6	32.7	26.8
13	20.25	25.3	28.05	32.15	26.15	21.1	33.3	34.35	33.75	33.6	32.45	26.85
14	21.3	25.45	28.15	32.2	25.8	21.2	33.8	34.35	33.8	33.6	32.2	26.85
15	21.35	25.5	28.3	32.2	25.4	21.3	34.1	34.35	33.9	33.65	31.9	26.85
16	21.4	25.6	28.5	32.25	25.1	21.4	34.2	34.15	33.95	33.7	31.7	26.9
17	21.45	25.7	28.6	32.25	24.8	21.5	34.3	34.25	34.0	33.75	31.25	26.9
18	21.5	25.8	28.7	32.25	24.55	21.75	34.5	34.6	34.0	33.8	30.95	26.7
19	21.55	25.9	28.8	32.25	24.15	22.0	34.65	34.7	34.0	33.8	30.65	26.6
20	21.6	26.05	28.9	32.3	23.75	22.3	34.75	34.7	33.95	33.75	30.3	26.5
21	21.7	26.2	29.0	32.0	23.35	22.6	34.8	34.7	33.95	33.75	30.0	26.2
22	21.8	26.35	29.1	31.7	23.05	23.0	34.8	34.75	33.95	33.85	30.0	26.1
23	21.85	26.5	29.3	31.5	22.8	23.45	34.8	34.85	33.95	33.9	29.9	25.95
24	22.0	26.6	30.0	31.3	22.45	23.9	34.85	34.95	33.9	33.95	29.55	26.1
25	22.1	26.7	30.3	31.2	22.05	24.2	34.9	34.95	33.9	33.9	29.15	26.15
26	22.2	26.75	30.5	31.1	21.7	24.5	34.85	34.75	33.9	33.9	28.9	26.2
27	22.3	26.8	30.7	30.95	21.45	24.9	34.8	34.55	34.05	33.95	28.65	26.1
28	22.4	26.85	30.85	30.7	21.1	25.8	34.75	34.4	34.15	34.0	28.4	26.1
29	22.5	26.90	30.95	30.5	......	26.2	34.75	34.4	34.15	34.0	28.2	25.85
30	22.6	27.1	31.0	30.3	......	26.6	34.75	34.3	34.2	33.95	28.15	25.7
1	22.7	......	31.05	30.1	......	26.9	......	33.7	......	33.85	27.9	......

Gate Openings, in inches, at Indian Lake Reservoir at Indian Lake, for the year ending September 30, 1919

FROM		TO		Sluice gate A—open	Sluice gate B—open
Date	Hour	Date	Hour		
				Inches	*Inches*
Oct. 1	......	Jan. 20	......	......	Closed
Oct. 1	......	Feb. 6	......	Closed	......
Jan. 20	8 P. M.	Mar. 5	2 P. M.	......	54
Feb. 6	1 P. M.	Mar. 5	2 P. M.	60	......
April 15	9 P. M.	April 17	7 P. M.	60	......
April 18	1 P. M.	April 18	7 P. M.	60	......
May 6	4 P. M.	May 7	9 P. M.	48	......
May 31	1 P. M.	June 1	1 P. M.	60	......
June 1	......	July 5	......	Closed	......
Mar. 5	......	Aug. 12	......	......	Closed
July 5	6 P. M.	July 11	3 P. M.	30	......
Aug. 4	8 P. M.	Aug. 26	1 P. M.	30	......
Aug. 12	3 P. M.	Aug. 16	4 P. M.	......	30
Aug. 16	4 P. M.	Aug. 21	6 P. M.	......	54
Aug. 25	5 P. M.	Aug. 29	11 A. M.	......	54
Aug. 29	11 A. M.	Aug. 30	6 P. M.	......	30
Aug. 30	6 P. M.	Sept. 2	7 P. M.	......	54
Aug. 31	8 A. M.	Sept. 3	6 P. M.	30	......
Sept. 6	12 NOON	Sept. 10	2 P. M.	......	54
Sept. 17	4 P. M.	Sept. 23	3 P. M.	60	......
Sept. 20	4 P. M.	Sept. 23	3 P. M.	......	30
Sept. 27	2 P. M.	......	......	60	......

NOTE:— The main logway was open 15 feet during the following periods:
May 5 — 5 A. M. to 4 P. M.
May 16 — 5 A. M to 3 P. M.
May 26 — 5 A. M. to 6 P. M.
May 27 — 1 P. M. to 6 P. M.
May 28 — 6 A. M. to 5 P. M.
It was also open 7 feet 6 inches from 1 P. M. May 31, to 1 P. M. June 1.

INDIAN RIVER NEAR INDIAN LAKE, N. Y.

Location.—About three-fourths of a mile below the dam at outlet of Indian Lake, 2 miles south of Indian Lake village, Hamilton County, 1 mile above mouth of Big Brook, and 6½ miles above mouth of Indian River.

Drainage area.— 132 square miles (measured on topographic maps).

Records available.— July 1, 1912, to June 30, 1914; June 5, 1915 to September 30, 1919; also miscellaneous measurements in 1911.

Gage.— Gurley 7-day graph water-stage recorder; installed August 30, 1916, on right bank three-fourths mile below dam, at same datum as staff gage previously used. Recorder inspected by Lester Sevarie.

Discharge measurements.— Made from cable about 75 feet below gage, or by wading.

Extremes of discharge.— Maximum stage during year from water-stage recorder, 5.88 feet at 9 A. M. May 5 (discharge, 2,060 second-feet; minimum stage from water-stage recorder, 0.04 foot at 5 A. M. October 2 (discharge, 1.3 second-feet).

1912–1919: Maximum stage recorded, 7.8 feet at 4 P. M. March 28, 1913 (discharge, 3,460 second-feet); minimum stage from water-stage recorder, .04 foot at 5 A. M. October 2, 1918 (discharge, about 1.3 second-feet).

Channel and control.— Control is a reef of coarse gravel; permanent.

Ice.— Stage-discharge relation not affected by ice.

Regulation.— Discharge is regulated by operation of the sluice gates at Indian Lake dam.

Accuracy.— State-discharge relation permanent. Rating curve well defined between 15 and 1,500 second-feet. Operation of water-stage recorder satisfactory except for periods indicated in footnote to daily-discharge table. Daily discharge ascertained by applying to rating table mean daily gage height determined by inspection of the recorder graph, or for days when there have been changes in openings of sluice gates at Indian Lake dam, by averaging the discharge for bi-hourly intervals of the day. Records good except for periods for which recorder did not operate satisfactorily.

Discharge measurements of Indian River near Indian Lake, during the year ending September 30, 1919

DATE	Made by	Gage height	Discharge
		Feet	*Sec.-ft.*
Nov. 14	E. D. Burchard	0.25	5.22
Feb. 11	do	3.56	838
April 6	M. H. Carson	.54	19.4

Daily discharge, in second-feet, of Indian River near Indian Lake, for the year ending September 30, 1919

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1......	1.5	5.2	12	51	584	725	12	418	838	124	90	788
2......	1.4	4.6	11	54	584	704	13	471	207	118	89	702
3......	1.8	4.3	11	54	564	704	14	526	128	109	86	210
4......	1.9	4.2	12	60	564	684	16	545	59	103	142	4.5
5......	1.7	4.0	12	59	564	396	18	1,310	62	164	420	2.7
6......	3.7	4.0	13	60	716	6.8	21	703	63	359	322	208
7......	3.7	3.9	15	60	875	3.9	23	890	66	341	316	508
8......	2.4	3.9	15	62	875	3.4	24	436	67	328	313	489
9......	1.9	3.9	15	62	853	3.0	29	436	69	313	307	508
10......	1.7	4.2	15	62	853	3.9	37	418	67	310	307	330
11......	1.5	4.4	16	66	832	3.2	57	418	67	221	304	4.2
12......	1.7	4.4	16	66	832	2.4	76	436	66	57	445	2.7
13......	1.6	4.4	16	66	832	2.6	82	436	66	56	643	2.0
14......	1.6	5.2	17	65	810	2.6	103	436	79	53	643	1.9
15......	1.6	5.5	20	65	810	2.2	175	418	92	61	643	1.8
16......	1.5	5.2	20	66	788	2.2	584	831	92	73	684	1.7
17......	1.6	5.2	20	67	788	2.0	594	453	100	77	832	72
18......	1.5	6.5	20	70	767	3.9	433	584	98	80	832	353
19......	1.6	8.6	20	70	767	5.2	388	643	97	84	832	353
20......	1.5	7.5	22	158	767	6.5	436	664	94	83	832	442
21......	1.9	7.9	22	603	767	9.5	453	643	90	86	692	664
22......	1.9	9.0	24	603	767	9.0	471	623	79	95	284	664
23......	1.9	10	29	603	746	5.8	471	643	77	95	363	462
24......	1.9	10	32	603	746	5.5	489	684	74	92	810	4.2
25......	2.0	10	36	623	725	4.4	489	704	79	84	810	3.7
26......	2.8	9.9	42	603	725	4.2	489	1,280	76	83	664	3.2
27......	3.0	9.0	48	603	725	5.2	453	796	108	90	526	127
28......	3.0	9.0	51	603	725	13	436	651	127	100	508	353
29......	2.8	12	51	603	......	14	415	436	131	100	404	347
30......	3.9	13	49	584	......	11	405	402	129	95	320	341
31......	9.0	......	49	584	......	11	......	820	......	95	658	......

Note.— Discharge estimated Nov. 2–7, by computing discharge from record of gate openings at dam at Indian Lake Reservoir, and comparing hydrograph with hydrograph of Hudson, Indian Lake.

Monthly discharge of Indian River near Indian Lake, for the year ending September 30, 1919

[Drainage area, 132 square miles]

MONTH	Discharge in Second-feet				Run-off
	Maximum	Minimum	Mean	Per square mile	Depth in inches on drainage area
October	9.0	1.4	2.31	.018	.02
November	13.0	3.9	6.63	.050	.06
December	51	11	24.2	.183	.21
January	623	52	257	1.95	2.25
February	875	564	748	5.67	5.90
March	725	2.0	108	.818	.94
April	594	12	257	1.95	2.18
May	1,310	402	618	4.68	5.40
June	838	59	115	.871	.97
July	359	53	133	1.01	1.16
August	832	86	488	3.70	4.27
September	788	1.7	265	2.01	2.24
The year	1,310	1.4	249	1.89	25.60

Schroon River at Riverbank

Location.—At the steel highway bridge near Riverbank post office, Warren County, near Tumblehead Falls, about 9 miles below Schroon Lake and about 9 miles above Warrensburg.

Drainage area.— 534 square miles.

Records available.— September 2, 1907, to September 30, 1919.

Gage.— Chain, on upstream side of bridge; read by J. H. Roberts.

Discharge measurements.— Made from the upstream side of bridge.

Channel and control.— Gravel; ocasionally shifting. Logs become lodged on the control at times nearly every year.

Extremes of discharge.— Maximum stage recorded during year, 6.7 feet at 8 A. M. and 4 P. M. April 13 (discharge 4,800 second-feet?); minimum stage recorded 1.40 feet at 4 P. M. August 12 (discharge, 145 second-feet).

1907–1919: Maximum stage recorded, 10.7 feet at 5 P. M. March 28, 1913 (discharge about 13,500 second-feet); minimum stage recorded, 0.85 foot at 5 P. M. October 17, 1909 (discharge, 28 second-feet).

Ice.— Stage-discharge relation affected by ice.

Regulation.— Flow affected by storage in Schroon and Brant lakes.

Accuracy.— Stage-discharge relation probably permanent during year. Affected by ice January 9 to 14, and by logs on the control March 26 to June 30. Rating curve fairly well defined between 150 and 4,000 second-feet. Gage read to hundredths twice daily. Daily discharge ascertained by applying mean daily gage height to rating table. Records good for periods when stage-discharge relation was not affected by ice or logs; fairly good for other periods.

Discharge measurements of Schroon River at Riverbank, during the year ending Sept. 30, 1919.

DATE	Made by	Gage height	Discharge
		Feet	*Sec.-ft.*
Jan. 11*a*	E. D. Burchard	3.29	729
Feb. 14	do	2.27	425
May 10*b*	O. W. Hartwell	3.82	1,330
June 18*b*	C. C. Covert	2.52	524
Aug. 15	do	1.62	212

a Partial ice cover on control.
b Logs on shallow part of control.

Daily discharge, in second-feet, of Schroon River at Riverbank, for the year ending Sept. 30, 1919.

DAY	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1	388	1460	1290	800	610	407	3200	1100	1100	690	316	186
2	333	1550	990	860	585	427	3000	1100	1100	585	281	186
3	388	1550	990	860	560	427	2600	1200	1000	351	264	186
4	351	1640	990	860	535	447	2400	1100	1100	201	232	186
5	407	1550	920	860	535	490	2200	1300	1100	248	216	316
6	490	1460	920	920	535	468	2200	1200	850	232	232	351
7	690	1370	800	920	512	512	2400	1200	650	264	216	298
8	1060	1290	800	745	490	512	2600	1400	750	232	216	369
9	1130	1130	772	750	490	635	2800	1400	700	216	201	407
10	1060	1060	772	750	468	690	2800	1400	650	264	201	407
11	990	1130	718	750	447	662	3000	1600	1000	316	172	407
12	920	920	745	700	447	662	4000	1500	750	298	145	407
13	1210	920	800	700	447	718	4800	1500	900	298	186	407
14	1290	860	860	700	427	662	4600	1500	500	298	186	388
15	800	800	800	718	427	662	3800	1600	500	316	201	388
16	369	800	860	800	407	662	3800	1400	420	333	172	407
17	447	800	860	718	407	690	3600	1400	500	333	169	388
18	468	860	860	690	407	745	3400	1400	500	351	186	369
19	468	1210	860	662	407	860	3200	1500	360	333	186	351
20	447	1550	800	690	388	1130	3000	1600	500	316	172	351
21	512	1550	772	718	369	1290	2800	1500	400	298	172	351
22	535	1640	772	635	369	1640	2400	1700	380	298	172	351
23	585	1640	635	610	351	1940	2400	2800	380	333	172	351
24	585	1550	690	690	369	2040	2200	3200	380	351	186	351
25	490	1550	800	745	351	2150	2000	3400	420	369	172	351
26	585	1370	920	690	333	2000	1800	3400	460	333	172	351
27	535	1290	920	690	333	2000	1600	2600	500	351	172	407
28	585	1130	920	690	351	2200	1600	2400	320	407	186	388
29	610	1210	920	690	......	3000	1400	1900	380	407	172	369
30	635	1130	920	662	......	3600	1400	1700	500	333	172	351
31	920	......	800	635	......	3600	......	1600	......	333	172	......

NOTE.— Stage-discharge relation affected by ice Jan. 9 to 14, and by logs on control March 26 to June 30. Daily discharge for these periods is approximate.

Monthly discharge of Schroon River at Riverbank, for the year ending Sept. 30, 1919.
[Drainage area, 534 square miles]

MONTH	DISCHARGE IN SECOND-FEET				RUN-OFF
	Maximum	Minimum	Mean	Per square mile	Depth in inches on drainage area
October	1,290	333	654	1.22	1.41
November	1,640	800	1,270	2.38	2.66
December	1,290	635	854	1.60	1.85
January	920	610	739	1.38	1.59
February	610	333	441	.826	.86
March	3,600	407	1,220	2.28	2.63
April	4,800	1,400	2,770	5.19	5.79
May	3,400	1,100	1,730	3.24	3.74
June	1,100	320	635	1.19	1.33
July	690	201	332	.622	.72
August	316	145	196	.367	.42
September	407	186	346	.648	.72
The year	4,800	145	932	1.75	23.72

SACANDAGA RIVER NEAR HOPE

Location.—About 1½ miles below junction of east and west branches, 3¼ miles above Hope post office, Hamilton County, and 12 miles above Northville.

Drainage area.— 494 square miles (measured on topographic maps).

Records available.— September 15, 1911, to September 30, 1919.

Gage.— Staff in two sections, the lower inclined, the upper vertical; read by Melvin Willis.

Discharge measurements.—Made from a cable about 100 feet below the gage or by wading.

Channel and control.— Rocky; probably permanent.

Extremes of discharge.— Maximum stage recorded during year, 7,00 feet at 7.15 A. M. April 12 (discharge 9,540 second-feet); minimum stage recorded, 1.50 feet at 6:30 P. M. October 13, and 7 A. M. October 14 (discharge 71 second-feet).

1911–1919: Maximum stage recorded, 10.0 feet at 5:30 P. M. March 27,

Extremes of discharge.— Maximum stage recorded during year, 7:00 feet at 7;55 A. M. September 30, 1913 (discharge about 20 second-feet).

Ice.— Stage-discharge relation affected by ice.

Accuracy.— Stage-discharge relation permanent; usually affected by ice during much of the period December to March, inclusive. Rating curve well defined between 60 and 10,000 second-feet. Gage read to half-tenths twice daily. Daily discharge ascertained by applying mean daily gage height to rating table. Records good for periods when the stage-discharge relation is not affected by ice; fair for other periods.

Discharge measurements of Sacandaga River near Hope, during the year ending Sept. 30, 1919.

DATE	Made by	Gage height	Discharge
		Feet	*Sec.-ft.*
Oct. 24	E. D. Burchard	2.80	663
June 21	C. C. Covert	2.12	272
Aug. 13	do	1.87	184

Daily discharge, in second-feet, of Sacandaga River near Hope, for the year ending Sept. 30, 1919

DAY	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1	......	......	740	1060	590	1060	4230	1560	865	190	421	660
2	......	......	590	1110	525	1440	4230	3130	660	178	380	660
3	......	......	625	1680	438	1330	4230	2930	558	175	340	1010
4	......	......	625	1560	432	1220	4480	2740	454	161	320	740
5	......	......	590	1330	416	1220	4990	2560	385	154	301	590
6	......	......	465	1110	410	1810	5250	2560	465	310	320	525
7	......	......	438	1010	400	1940	5250	2390	438	390	350	438
8	......	......	410	960	395	1680	5250	2390	365	370	301	380
9	......	......	395	910	390	1680	5250	2230	340	355	273	525
10	......	......	380	910	380	1810	5250	1940	320	465	238	525
11	......	......	438	865	370	1940	5790	2080	292	1440	213	495
12	......	......	525	820	360	2080	8830	2080	278	1110	186	700
13	......	......	558	780	350	2230	4990	1940	264	740	168	660
14	......	......	1060	740	340	2230	3130	1810	255	525	158	525
15	......	......	1560	740	335	2390	2930	1680	350	465	150	465
16	......	......	1220	740	350	2560	2740	1680	320	910	147	465
17	......	1330	780	700	370	2740	2560	1810	292	660	147	421
18	......	1940	700	660	400	2930	2390	2930	282	525	175	370
19	......	2080	700	660	410	2930	2390	2560	260	460	400	320
20	......	1940	660	625	438	2930	2230	2390	247	432	525	292
21	......	1680	625	660	454	3130	1940	2230	230	421	465	590
22	......	1440	820	740	465	4480	1680	2230	205	700	421	820
23	......	1330	2930	910	465	5790	1560	2230	190	700	370	820
24	......	1220	2740	1440	525	5520	1560	2930	154	590	495	740
25	......	910	3990	1440	495	5520	1680	2930	141	410	625	700
26	......	590	2930	1060	465	5250	1440	2560	182	370	525	660
27	......	558	2080	910	465	4990	1330	2080	205	454	454	625
28	......	590	1680	820	438	4230	1330	1680	190	525	421	590
29	......	780	1440	740	......	3990	1330	1440	175	495	405	525
30	......	1060	1330	660	......	3990	1220	1220	154	495	390	495
31	......	......	1330	660	......	4230	......	1010	......	460	525	......

NOTE.— Monthly discharge estimated for October by comparison with Hadley station on basis of drainage areas; discharge estimated, Nov. 1–16, 1,150 second-feet. Daily gage height for these periods probably inaccurate.

Monthly discharge of Sacandaga River near Hope, for the year ending September 30, 1919

[Drainage area, 494 square miles]

MONTH	DISCHARGE IN SECOND-FEET				RUN-OFF
	Maximum	Minimum	Mean	Per square mile	Depth in inches on drainage area
October	....	....	600	1.21	1.40
November	....	....	1,190	2.41	2.69
December	3,990	380	1,140	2.31	2.66
January	1,680	625	936	1.89	2.18
February	590	335	424	.860	.90
March	5,790	1,060	2,940	5.95	6.86
April	8,830	1,220	3,380	6.84	7.63
May	3,130	1,010	2,190	4.43	5.11
June	865	141	317	.64	.71
July	1,440	154	504	1.02	1.18
August	625	147	342	.692	.80
September	1,010	292	578	1.17	1.30
The year	8,830	141	1,220	2.47	33.42

SACANDAGA RIVER AT HADLEY

Location.—About half a mile west of railroad station at Hadley, Saratoga County, 1 mile above mouth of river and 4½ miles below site of proposed storage dam at Conklingville.

Drainage area.— 1,060 square miles (measured on topographic maps).

Records available.— January 1, 1911 to September 30, 1919. September 13, 1907 to December 31, 1910, at upper bridge station; September 24, 1909 to midsummer of 1911, at lower bridge station.

Gage.— Gurley repeating hydrograph water-stage recorder in a concrete shelter on the left bank, installed January 6, 1916, replacing a Barrett and Lawrence recorder. Recorder inspected by J. F. Kelly.

Discharge measurements.— Made from a cable about 30 feet above the gage, or by wading under the cable, or about three-fourths of a mile above the gage.

Channel and control.— Very rough but permanent.

Extremes of discharge.— Maximum stage recorded during year, from water-stage recorder, 8.3 feet at 5 P. M. April 13 (discharge 11,860 second feet); minimum stage, from water stage recorder, 2.78 feet at 6 A. M. August 18 (discharge 254 second-feet).

1911–1919: Maximum stage recorded, from water-stage recorder 12.36 feet from 11 A. M. to noon Mrach 28, 1913 (discharge about 35,500 second-feet); minimum stage, from water-stage recorder, 2.25 feet all day September 15, 1913 (discharge about 61 second-feet).

Ice.— Stage-discharge relation ordinarily affected by ice.

Accuracy.— Stage-discharge relation permanent; usually affected by ice during a large part of period from December to March. Rating curve well defined between 150 and 20,000 second-feet. Operation of water-stage recorder satisfactory throughout the year. Daily discharge ascertained by applying to the rating table mean daily gage height determined by inspecting gage-height graph. Records excellent for periods when the stage-discharge relation was not affected by ice; fairly good for other periods.

Discharge measurements of Sacandaga River at Hadley, during the year ending September 30, 1919.

DATE	Made by	Gage height	Discharge
		Feet	*Sec.-ft.*
Jan. 16........	E. D. Burchard..................................	4.09	1,270

Daily discharge, in second-feet, of Sacandaga River at Hadley, for the year ending September 30, 1919

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1.....	1,660	5,210	1,800	2,780	1,190	865	6,980	2,520	1,800	910	928	976
2.....	1,340	5,600	1,290	2,960	1,060	1,170	5,860	3,990	1,520	770	804	966
3.....	1,150	5,080	1,270	3,560	966	1,520	4,950	5,080	1,270	660	652	1,060
4.....	1,090	4,340	1,390	3,460	910	1,780	4,340	5,470	1,090	573	539	1,380
5.....	901	3,660	1,390	2,690	864	1,950	4,220	5,340	956	506	455	1,290
6.....	1,040	3,150	1,240	2,110	847	2,350	4,460	5,210	838	480	418	1,060
7.....	1,600	2,600	1,010	1,950	787	2,780	4,820	4,950	778	532	418	778
8.....	1,710	2,270	1,040	1,880	745	2,870	5,600	4,820	738	706	430	580
9.....	1,540	1,880	1,170	1,900	698	3,060	6,270	4,700	778	622	461	539
10.....	1,310	1,720	1,350	1,720	722	3,990	6,980	4,220	873	552	474	864
11.....	1,120	1,650	1,240	1,450	869	4,220	7,740	4,100	882	1,220	378	1,240
12.....	996	1,520	1,060	1,350	801	4,340	9,370	4,460	821	2,270	328	1,120
13.....	882	1,370	1,080	1,250	683	4,460	11,500	4,820	730	1,650	307	1,060
14.....	821	1,310	1,100	1,250	594	3,770	11,100	4,700	660	1,160	292	910
15.....	778	1,220	1,390	1,250	630	3,350	9,030	4,340	630	910	288	746
16.....	730	1,150	2,350	1,270	714	2,960	7,430	3,770	919	847	278	637
17.....	668	1,090	2,780	1,280	939	2,430	6,700	3,350	1,070	1,100	273	587
18.....	683	1,630	2,600	1,090	910	2,780	6,270	3,560	1,140	966	263	545
19.....	714	3,660	2,190	1,040	917	3,770	5,860	4,100	947	787	331	480
20.....	675	4,100	1,770	1,040	824	4,580	5,210	3,990	746	668	716	424
21.....	1,010	3,990	1,560	956	690	5,470	4,580	3,660	622	594	1,140	412
22.....	1,880	3,560	1,520	938	580	6,160	3,990	4,220	526	688	812	455
23.....	1,880	3,060	2,640	910	566	6,840	3,460	5,600	467	1,250	652	668
24.....	1,700	2,600	3,770	1,430	552	6,980	3,150	6,270	401	1,220	683	1,240
25.....	1,440	2,110	4,460	1,950	587	6,980	3,250	6,700	366	1,060	675	1,170
26.....	1,270	1,740	6,840	2,270	552	6,700	3,250	6,550	339	938	864	1,120
27.....	1,430	1,260	7,130	2,110	601	6,410	3,060	5,860	339	864	778	1,020
28.....	1,580	1,270	6,140	1,880	652	8,050	2,690	5,080	1,460	1,270	698	882
29.....	1,490	1,530	4,950	1,650	......	8,370	2,600	4,220	1,720	1,680	652	762
30.....	1,490	1,760	3,880	1,490	......	8,050	2,600	3,250	1,160	1,340	608	668
31.....	3,350	......	3,060	1,340	......	7,740	......	2,520	......	1,090	660	......

NOTE.— Stage-discharge relation not affected by ice.

Monthly discharge of Sacandaga River at Hadley, for the year ending September 30, 1919
[Drainage area, 1,060 square miles]

MONTH	DISCHARGE IN SECOND-FEET				RUN-OFF
	Maximum	Minimum	Mean	Per square mile	Depth in inches on drainage area
October..........................	3,350	668	1,290	1.22	1.41
November..........................	5,600	1,090	2,570	2.42	2.70
December..........................	7,130	1,010	2,470	2.33	2.69
January..........................	3,560	910	1,750	1.65	1.90
February..........................	1,190	552	766	.723	.75
March..........................	8,370	865	4,410	4.16	4.80
April..........................	11,500	2,600	5,580	5.26	5.87
May..........................	6,700	2,520	4,560	4.30	4.96
June..........................	1,800	339	886	.836	.93
July..........................	2,270	480	964	.909	1.05
August..........................	1,140	263	557	.525	.61
September..........................	1,380	412	855	.807	.90
The year..........................	11,500	263	2,230	2.10	28.57

FEEDER CANAL AT GLENS FALLS

Location.— Slope station in upper end of canal.

Records available.— Continuous records from May 15, 1919, to September 30, 1919; occasional current meter measurements previous to 1919.

Gages.— Two 7-day Gurley water-stage recorders with scales of 2 to 1 for gage height. The float wells are 1½ by 2 feet, inside dimensions, located with the bottoms about 2 feet below normal pool elevation. They are about 2 miles apart. Gage No. 1 is located on the right bank just below the intake lock. Gage No. 2 is located on the bank just below the highway bridge crossing to the cement mills. Both gages were inspected by Fred B. Kraft of the State Engineer Department.

Discharge measurements.— Made from the first change bridge below intake to canal.

Determination of discharge.— Daily discharge determined by use of Chezy formula. The coefficient is computed from each current meter measurement and plotted on a curve showing the variation of " C " through the season. A smooth curve drawn through the plotted points gives coefficient for each day. Other factors in Chezy formula are taken from gage height records.

Regulation.— Flow in canal is regulated by gates at intake.

Ice.— No flow in canal during frozen season.

Accuracy.— The values of the coefficients as determined appear to be consistent. Daily discharge as computed is considered to fairly represent the facts. Except on some days when there is considerable diurnal fluctuation, results are believed to be good.

Cooperation.— Station established and maintained by the United States Geological Survey in cooperation with the State Engineer and Surveyor.

Discharge measurements of Feeder Canal at Glens Falls, during the year ending September 30, 1919

DATE	Made by	Gage height No. 1	Gage height No. 2	Discharge
		Feet	*Feet*	*Sec.-ft.*
May 21	J. W. Moulton	280.584	280.090	188
22	do	280.568	279.995	185
23	do	280.595	279.742	244
23	do	280.497	279.948	184
July 5	M. H. Carson	281.402	280.220	202
Aug. 12	A. H. Davison	281.99	280.27	260
Sept. 3	M. H. Carson	281.98	280.44	255
3	do	281.95	280.41	256
27	C. C. Covert	281.905	280.655	254

Daily gage height, in feet, of Feeder Canal at Glens Falls, Gage No. 1, for the year ending September 30, 1919.

DAY	May	June	July	Aug.	Sept.
1	....	280.516	281.436	281.078	282.170
2	....	280.554	281.450	281.321	282.042
3	....	280.604	281.460	281.510	281.988
4	....	280.520	281.480	281.614	281.974
5	....	280.766	281.424	281.604	282.014
6	....	280.880	281.452	281.628	282.112
7	....	280.880	281.504	281.530	282.010
8	....	280.876	281.408	281.544	282.220
9	....	280.968	281.482	281.512	282.078
10	....	280.958	281.542	281.190	282.032
11	....	281.034	281.606	281.700	282.096
12	....	281.044	281.606	281.918	282.144
13	....	281.054	281.560	281.506	282.154
14	....	281.076	281.668	280.538	282.130
15	....	281.132	281.628	281.292	281.746
16	....	281.326	281.528	281.632	281.986
17	280.566	281.180	281.614	281.800	281.903
18	280.470	281.218	281.674	282.054	282.216
19	280.658	281.150	281.652	281.986	282.132
20	280.604	281.136	281.662	281.906	282.104
21	280.540	281.094	281.638	281.940	282.126
22	280.526	281.070	281.626	281.890	282.148
23	280.502	281.136	281.226	282.080	282.024
24	280.444	281.316	281.530	282.058	282.140
25	280.482	281.324	281.508	282.186	282.052
26	280.410	281.360	281.434	282.062	282.008
27	280.400	281.480	281.247	282.080	282.020
28	280.398	281.390	280.080	282.132	282.028
29	280.578	281.436	280.874	282.110	281.892
30	280.62	281.430	280.922	282.026	282.052
31	280.60	....	281.150	282.028	....

Daily gage height, in feet, of Feeder Canal at Glens Falls, Gage No. 2, for the year ending September 30, 1919.

DAY	May	June	July	Aug.	Sept.
1	....	279.778	280.262	279.636	280.564
2	....	279.750	280.184	279.900	280.568
3	....	279.848	280.150	280.068	280.494
4	....	279.682	280.252	280.078	280.500
5	....	279.906	280.242	280.242	280.450
6	....	280.084	280.276	280.284	280.55
7	....	280.09	280.144	280.106	280.618
8	....	280.08	280.036	280.166	280.556
9	....	280.07	280.218	280.100	280.624
10	....	280.03	280.312	280.000	280.544
11	....	280.08	280.238	280.250	280.594
12	....	280.08	280.220	280.366	280.758
13	....	280.08	280.278	280.144	280.702
14	....	280.10	280.330	279.424	280.718
15	....	280.158	280.304	279.860	280.490
16	....	280.246	280.262	280.084	280.570
17	279.784	280.052	280.416	280.176	280.466
18	279.914	280.118	280.53	280.508	280.684
19	280.074	279.976	280.54	280.512	280.71
20	280.010	279.996	280.510	280.410	280.63
21	279.962	279.994	280.268	280.396	280.56
22	279.936	279.974	280.504	280.372	280.56
23	279.858	279.990	279.115	280.574	280.57
24	279.796	280.098	280.190	280.526	280 50
25	279.842	280.176	280.180	280.646	280.58
26	279.706	280.166	280.088	280.460	280.51
27	279.688	280.300	279.836	280.562	280.61
28	279.670	280.084	278.534	280.618	280.68
29	279.862	280.340	279.836	280.60	280.432
30	279.94	280.178	279.842	280.57	280.664
31	279.70	....	279.758	280.560	....

HOOSIC RIVER NEAR EAGLE BRIDGE

Location.— Half a mile below Walloomsac River and 1½ miles above Owl Kill and Eagle Bridge, Rensselaer County.

Drainage area.— 512 square miles (measured on topographic maps).

Records available.—August 13, 1910, to September 30, 1919. September 25, 1903, to December 31, 1908, at Buskirk, 4 miles below present station.

Gage.— Chain gage on left bank near the farm house of James Russell about 1½ miles above Eagle Bridge, installed September 4, 1918. Gage read by Mrs. J. E. Sherman and Dennis Mironowiez.

Discharge measurements.— Made from cable half mile below gage, or by wading.

Channel and control.— Gravel; somewhat shifting.

Extremes of discharge.— Maximum stage recorded during year, 9.45 feet at 5 P. M. March 1 (discharge 7,920 second-feet); minimum stage recorded, 2.25 feet at 7 P. M. August 3 (discharge 65 second-feet).

1910–1919: Maximum stage not recorded, as gage used prior to August 17, 1914, could not be reached at high stages; minimum stage recorded, 6.1 feet at 5 P. M. September 14, 1913 (discharge practically zero).

Ice.— Stage discharge relation affected by ice.

Regulation.— Flow affected by storage on Walloomsac River and at Hoosick Falls about 2 miles above gage.

Accuracy.— Stage-discharge relation probably permanent during year; usually affected by ice during much of period December to March, inclusive. Rating curve well defined between 75 and 7,000 second-feet. Gage read to quarter-tenths twice daily. Daily discharge ascertained by applying mean daily gage height to rating table. Records good except for periods of low water, when semi-daily gage heights may not indicate the true mean and during periods when the stage-discharge relation is affected by ice; fair for the latter periods.

Discharge measurements of Hoosic River near Eagle Bridge, during the year ending September 30, 1919

DATE	Made by	Gage height	Discharge
		Feet	*Sec.-ft.*
April 11	M. H. Carson	5.69	2,160
July 4	O. W. Hartwell	2.66	146
Sept. 1	M. H. Carson	2.86	173

Daily discharge, in second-feet of Hoosic River near Eagle Bridge, for the year ending Sept. 30, 1919

DAY	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1......	765	765	528	1,020	670	4,750	*b*	670	800	268	145	178
2......	610	670	450	3,590	610	2,100	*b*	670	730	196	96	130
3......	555	528	450	2,210	700	1,190	*b*	940	555	165	110	145
4......	528	582	450	1,770	670	1,280	*b*	800	555	165	96	730
5......	610	670	500	1,470	582	1,280	*b*	3,870	450	74	185	475
6......	980	582	428	1,400	555	1,770	*b*	1,880	405	140	152	405
7......	1,190	610	382	950	640	1,370	*b*	1,670	405	205	152	170
8......	730	500	450	800	528	1,100	*b*	1,570	405	205	185	220
9......	700	528	800	750	360	1,100	*b*	1,470	360	196	152	1,100
10......	610	475	450	750	528	2,810	*b*	1,670	428	165	185	980
11......	500	450	360	750	500	1,770	2,210	2,100	450	730	160	610
12......	428	500	450	*a*	528	1,280	3,320	1,990	450	320	178	1,470
13......	500	500	405	*a*	500	1,100	3,590	2,210	320	235	104	1,470
14......	610	450	940	*a*	450	800	2,330	1,670	285	214	100	800
15......	555	382	3,870	*a*	500	730	1,990	1,280	302	196	136	670
16......	450	405	2,450	*a*	302	800	1,670	1,100	360	285	120	730
17......	405	320	1,670	*a*	428	1,190	1,990	1,370	320	360	136	670
18......	405	730	1,280	*a*	528	2,450	1,880	3,190	475	220	140	528
19......	382	2,330	940	*a*	405	2,450	1,570	1,770	450	185	185	360
20......	285	1,770	870	*a*	340	1,880	1,370	1,770	450	165	285	302
21......	700	1,370	800	750	340	2,450	1,280	1,570	235	152	250	405
22......	670	1,370	765	800	320	2,400	1,100	3,590	360	235	185	940
23......	555	1,190	2,930	1,100	220	2,200	940	3,190	285	285	205	1,100
24......	428	940	1,770	1,990	250	2,200	1,020	2,210	235	235	205	1,100
25......	360	940	2,810	1,100	268	2,200	1,020	1,990	320	178	360	905
26......	450	870	2,210	940	1,190	2,200	800	1,990	178	178	428	765
27......	340	610	1,570	980	528	2,400	800	1,670	220	185	190	555
28......	475	500	1,370	800	500	2,800	940	1,280	500	160	220	500
29......	360	640	940	800	......	2,800	800	1,190	268	152	205	450
30......	405	610	800	765	......	2,400	670	940	196	140	214	382
31......	835	......	905	670	......	2,000	......	800	......	124	190	......

a Estimated mean daily flow 700 c. f. s. *b* Estimated mean daily flow 2000 c. f. s.

NOTE.— Discharge estimated because of no record Jan. 6–23, March 22 to April 10, from comparison with Schroon at Riverbank and Sacandaga at Hadley and study of discharge hydrograph.

Monthly discharge of Hoosic River near Eagle Bridge, for the year ending September 30, 1919

[Drainage area, 512 square miles]

MONTH	DISCHARGE IN SECOND-FEET				RUN-OFF
	Maximum	Minimum	Mean	Per square mile	Depth in inches on drainage area
October..........................	1,190	285	560	1.09	1.26
November..........................	2,330	320	760	1.48	1.65
December..........................	3,870	360	1,130	2.21	2.55
January..........................	3,590	670	1,050	2.05	2.36
February..........................	1,190	220	498	.973	1.01
March..........................	4,750	730	1,910	3.73	4.30
April..........................	3,590	670	1,710	3.34	3.73
May..........................	3,870	670	1,740	3.40	3.92
June..........................	800	176	392	.766	.85
July..........................	730	74	217	.424	.49
August..........................	428	96	182	.355	.41
September..........................	1,470	130	642	1.25	1.40
The year..........................	4,750	74	903	1.76	23.93

MOHAWK RIVER AT VISCHER FERRY DAM

Location.—At Vischer Ferry dam of Barge Canal (Lock No. 7), 1 mile above Stony Creek and Vischer Ferry, 7 miles below Schenectady, Schenectady County, and 11 miles above mouth.

Drainage area.—3,430 square miles (measured on topographic maps).

Records available.— June 24, 1913, to September 30, 1919.

Gage.— Stevens water-stage recorder (showing head on crest of spillway) in the southerly corner of the basin near upper end of Barge Canal lock, installed August 18, 1916. Staff gage in masonry of outer lock wall, just above upper gates. Datum of staff gage 12.1 feet lower than that of recorder. Water-stage recorder inspected by engineers from the Albany office of the United States Geological Survey; staff read by lock tenders.

Channel and control.— The control is the crest of the spillway.

Extremes of discharge.—Maximum stage during year.* Minimum stage, from water-stage recorder, 0.21 foot at 10 A. M. December 3 (discharge 380 second-feet).

1913–1919: Maximum stage recorded, 7.6 feet just before noon March 28, 1914, determined by leveling from flood marks (discharge not determined). Minimum stage from water-stage recorder, 0.18 foot from 4 A. M. to 5 A. M. and 4 P. M. to 6 P. M. October 31, 1914 (discharge about 290 second-feet).

Diversions.— Barge Canal Lock No. 7, at the south end of dam was put in operation May 15, 1915. The following tables of discharge include the flow over the spillway and through lock and water wheels.

Regulation.— Flow affected by operation of dams upstream.

Accuracy.— Stage-discharge relation practically permanent. Probably not affected by ice. Rating curve well defined by discharge measurements between 350 and 2,500 second-feet; above 2,500 second-feet, based on theoretic coefficients.

Daily discharge, in second feet of Mohawk River at Vischer Ferry Dam, for the year ending September 30, 1918

DAY	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1.....	1,200	23,900	3,930	2,360	1,620	14,200	15,800	7,970	2,940	2,490	1,080	2,700
2.....	1,740	14,900	4,810	2,310	1,620	13,700	18,200	9,170	2,790	4,800	1,250	1,750
3.....	1,570	9,830	5,570	2,260	1,580	11,700	18,900	7,610	2,020	2,690	1,510	1,600
4.....	1,740	7,280	4,860	2,210	1,440	11,300	15,700	5,700	2,080	2,490	1,490	1,620
5.....	2,390	5,740	4,780	2,130	1,480	9,330	12,500	5,860	2,020	1,950	1,450	1,660
6.....	2,670	5,120	5,620	2,080	1,920	8,370	10,500	4,770	2,180	2,700	1,510	1,940
7.....	2,800	5,020	3,950	2,020	1,820	10,200	9,790	4,880	2,610	2,130	1,530	2,520
8.....	1,720	5,270	3,390	1,870	1,620	10,300	9,680	5,090	3,480	1,660	2,730	1,260
9.....	1,810	4,470	2,890	1,720	1,530	8,450	15,000	3,610	2,850	1,950	1,490	1,180
10.....	2,130	3,750	2,490	1,620	1,480	7,090	19,600	3,340	3,340	2,280	3,570	1,110
11.....	2,340	3,920	2,340	1,580	1,440	6,160	15,800	4,880	4,620	3,030	2,490	1,320
12.....	1,910	3,740	2,210	1,770	1,340	6,080	13,200	4,880	11,100	2,610	1,650	1,890
13.....	2,680	3,770	2,380	1,530	1,390	7,610	11,400	6,030	8,900	3,040	1,640	2,490
14.....	2,440	3,620	2,330	1,530	1,970	15,200	12,500	14,700	5,670	3,600	1,380	2,640
15.....	3,410	3,410	1,900	1,720	4,460	13,200	16,700	11,100	3,730	5,180	1,600	2,540
16.....	6,380	3,310	1,800	1,620	5,370	8,930	14,600	7,900	3,590	5,240	1,240	2,270
17.....	4,310	2,870	1,950	2,020	5,300	7,010	13,600	5,110	3,440	2,950	1,350	1,790
18.....	4,120	3,220	2,210	1,920	4,880	15,200	16,700	4,540	3,500	3,350	1,060	3,420
19.....	2,290	2,990	2,430	1,620	4,240	20,400	19,200	4,000	2,340	3,040	980	2,880
20.....	6,830	3,100	2,430	1,670	10,800	22,100	15,700	3,720	2,150	2,440	1,120	2,960
21.....	8,070	3,230	2,430	2,020	27,600	26,000	12,600	4,920	2,090	2,350	1,320	3,830
22.....	6,490	3,790	2,210	1,670	14,500	28,700	16,800	4,270	3,260	1,820	1,260	3,730
23.....	4,480	8,840	2,240	1,670	10,500	36,000	18,800	4,580	2,770	2,180	1,140	2,560
24.....	5,870	6,680	2,290	1,580	8,370	29,500	15,700	3,560	2,590	1,650	1,130	3,620
25.....	10,200	4,820	2,340	1,770	7,970	22,800	12,700	3,660	3,150	1,710	1,160	2,910
26.....	8,880	2,820	2,390	1,720	9,410	19,300	10,300	2,800	2,520	1,480	1,210	7,360
27.....	6,520	2,470	2,440	1,770	18,800	14,400	7,740	5,120	2,340	1,420	1,020	10,700
28.....	7,120	3,690	2,490	1,970	15,700	11,100	7,010	5,400	2,020	1,250	1,000	7,270
29.....	8,980	2,340	2,490	2,020	......	11,000	6,610	4,470	2,540	1,160	1,180	4,280
30.....	23,200	2,650	2,490	1,670	......	13,400	7,010	3,750	1,560	1,180	1,300	3,400
31.....	43,900	......	2,440	1,670	......	14,900	......	3,300	......	1,020	1,830	......

Above figures are revised estimates and supersede the data published in the Eighth Annual Report of the Commission for 1918.

* Waste gates in dam open during spring floods. See record at Crescent Dam for maximum flow.

NOTE.— Discharge Dec. 5 to March 18, April 23 to May 17, June 18, Aug. 12 to 19, Aug. 26 to Sept. 6, Sept. 13 to 16, Sept. 27 to 30, assumed to be same as at Crescent.

Daily discharge, in second-feet, of Mohawk River at Vischer Ferry Dam, for the year ending September 30, 1919

DAY	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1	3,000	15,300	3,800	4,750	3,420	6,870	9,530	4,380	2,980	1,580	3,080	2,120
2	2,880	10,500	2,900	9,570	2,580	12,400	8,480	6,340	2,380	1,840	2,240	2,890
3	2.790	7,530	2,970	13,200	2,310	9,900	7,920	9,020	2,300	1,820	1,370	7,100
4	3.640	7,230	3,400	9,020	3,540	8,520	8,480	6,520	1,820	1,440	1,330	4,720
5	3,790	5,630	3,580	6,250	3,620	8,620	10,700	8,630	2,260	1,620	1,390	6,530
6	2,950	4,290	4,520	4,680	3,460	9,350	13,200	8,120	1,780	1,260	1,740	5,110
7	6,750	4,330	3,740	4,390	3,380	7,020	14,600	7,260	2,180	1,140	3,120	3,510
8	6,720	3,910	4,100	4,110	3,060	5,390	15,000	8,620	2,030	1,000	2,800	2,960
9	4,190	3,230	5.230	5,170	2,740	5,920	14,300	7,160	1,860	1,040	2,190	3,300
10	4,200	4,170	6,770	4,250	2,430	14,000	15,500	7,280	1,940	1,580	1,980	2,810
11	3,290	3,010	6,700	3,170	2,340	12,300	16,700	15,000	1,770	3,670	1,550	3,020
12	2,430	3,390	6,500	2,580	2,090	8,820	25,400	16,800	1,960	2,740	1,720	2,970
13	2,720	3,300	5,610	2,410	2,250	7,720	28,300	17,900	1,430	2,400	1,780	2,430
14	2,380	3,270	5,330	2,810	2,410	7,420	21,500	12,300	1,380	1,920	1,660	2,400
15	2,780	2,530	9,900	3,550	3,540	5,930	15,500	9,130	2,050	1,800	1,630	2,120
16	2,720	3.000	13,100	4,050	4,760	4,940	12,800	7,260	3.280	2,260	1,850	2,240
17	2,580	2,720	7,960	4,110	3,670	6,460	9,490	6,400	3,320	2,530	1,420	2,660
18	2,590	5,410	8,800	3,860	3.050	13,600	10.200	10,000	2,690	2,710	1,410	2,500
19	2,380	7,490	4,350	3,860	2,810	14,600	8,900	12,100	1,940	2,100	2,690	2,260
20	2,150	7,840	3,080	3,800	2,410	11,200	7,060	7,880	2,050	1,480	1,970	2,470
21	9,190	6,460	4,490	3,800	2,660	11,700	5,800	7,210	1,870	1,490	1,760	1,920
22	6,840	5,400	4,340	3,800	2,580	11,800	5,420	6,700	1,860	3,500	1,990	1,920
23	4,940	5,280	7,470	3,800	2,660	10,000	4,770	8,410	1,770	6,800	1,730	2,730
24	3,780	3,980	12,300	4,960	2,580	8,520	5,370	8,650	1,580	4,290	1,830	4,070
25	3,250	4,780	16,800	6,250	2,740	7,320	5,460	8,820	1;340	2,770	3,150	2,630
26	4.320	4,170	17,700	6,470	3,380	9,100	5,630	8,400	1.240	2,850	1,680	2,440
27	8,110	3,470	11,500	5,380	3,380	8,440	5,270	6,520	1,500	2,480	2,180	2,380
28	5,670	3,450	8.160	4,820	3,460	9,660	5,140	5,820	1,760	7,930	2,150	2,170
29	5,070	3,120	5,890	4,470	......	14,200	6,040	4,330	......	6,040	2,070	1,980
30	5,200	4,520	4,490	4,110	......	11,500	5,940	4,110	......	3,900	1,790	2,360
31	20,100	......	4,340	3,800	......	10,300	......	2,930	......	2,810	2,920	......

NOTE.— Discharge November 27 to 30, December 1 to 14 and 18 to 31, January 1 to 31, February 1 to 3, 12 to 14, and 17 to 20, March 26 to 31, April 1 to 17, and June 21 to 28, taken from record at Crescent Dam because of no record at Vischer Ferry.

Monthly discharge of Mohawk River at Vischer Ferry Dam, for the year ending Sept. 30, 1918

[Drainage area, 3,430 square miles]

MONTH	DISCHARGE IN SECOND-FEET				RUN-OFF
	Maximum	Minimum	Mean	Per square mile	Depth in inches on drainage area
October	43,900	1,200	6,140	1.79	2.06
November	23,900	2,340	5,350	1.56	1.74
December	5,620	1,800	2,920	.851	.98
January	2,360	1,530	1,840	.536	.62
February	27,600	1,340	6,080	1.77	1.84
March	36,000	6,080	14,600	4.26	4.91
April	19,600	6,610	13,700	4.00	4.46
May	14,700	2,800	5,510	1.61	1.86
June	11,100	1,560	3,340	.974	1.09
July	5.240	1,020	2,480	.723	.83
August	3,570	980	1,470	.429	.49
September	10,700	1,110	3,040	.886	.99
The year	42,900	980	5,530	1.62	21.87

NOTE.— Above figures are revised estimates and supersede the data published in the Eighth Annual Report of the Commission for 1918.

Monthly discharge of Mohawk River at Vischer Ferry Dam, for the year ending September 30, 191

[Drainage area, 3,430 square miles]

MONTH	DISCHARGE IN SECOND-FEET				RUN-OFF
	Maximum	Minimum	Mean	Per square mile	Depth in inches on drainage area
October	20,100	2,150	4,630	1.35	1.56
November	15,300	2,530	5,090	1.48	1.65
December	17,700	2,900	6,770	1.97	2.27
January	13,200	2,410	4,880	1.42	1.64
February	4,760	2,090	2,980	.869	.90
March	14,600	4,940	9,470	2.76	3.18
April	28,300	4,770	10,900	3.18	3.55
May	17,900	2,930	8,390	2.45	2.82
June	3,320	1,240	2,030	.592	.66
July	7,930	1,000	2,670	.778	.90
August	3,150	1,330	2,010	.586	.68
September	7,100	1,920	3,020	.880	.98
The year	28,300	1,000	5,260	1.53	20.79

MOHAWK RIVER AT CRESCENT DAM

Location.— At the Crescent Dam of the Barge Canal, about three miles above the mouth of the river at Cohoes.

Drainage area.— 3,490 square miles (measured on U. S. G. S. topographic maps by State Engineer Department).

Records available.— December 1, 1917, to September 30, 1919.

Gage.— Gurley 7-day graph water-stage recorder on left bank about 50 feet above guard gate at head of Waterford flight of locks. It is about 200 yards from left end of spillway. Inspected by operator from Barge Canal power house at the dam.

Determination of discharge.— The rating curve for the spillway has been computed from discharge determined from records at Vischer Ferry and gage heights observed at Crescent. Discharge through the locks and water wheels determined from records of operation of the locks.

Channel and control.— The control is the crest of the spillway.

Extremes of discharge.— Maximum stage during year, from water-stage recorder 7.59 feet at 2 A. M. April 13 (discharge 30,100 second-feet); minimum stage, from water-stage recorder 4.31 feet at 2 P. M. and 8 P. M. July 9 (discharge 669 second-feet).

1917–1919: Maximum stage recorded 7.9 feet at 7 P. M. March 23, 1918 (discharge 38,100 second-feet); minimum stage recorded 4.04 feet at 6 A. M. August 21, 1918 (discharge zero).

Diversions.— Water is diverted at this point for canal purposes through Lock 6 and through the power plant located at this lock. The following tables of discharge include the flow through Lock 6 and through the power plant.

Regulation.— Seasonal distribution of flow regulated by the Delta reservoir on the upper Mohawk, and by Hinckley reservoir on West Canada Creek. Large irregular diurnal fluctuations during low water caused by operation of movable dams upstream.

Accuracy.— Stage-discharge relation permanent. Probably not affected by ice. Since rating is based on computation only, its accuracy is indeterminate. Record from water-stage recorder satisfactory. Results probably fairly good for periods of low water and fair for other periods.

Cooperation.— Station established and maintained by the United States Geological Survey in cooperation with the State Engineer and Surveyor. Recorder inspected by an employee of the State Superintendent of Public Works.

Daily discharge, in second-feet, of Mohawk River at Crescent Dam, for the year ending September 30, 1919

DAY	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1.....	2,860	15,900	3,890	4,750	3,420	6,270	9,530	5,480	3,280	1,250	2,420	1,720
2.....	2,850	10,200	2,900	9,570	2,580	11,900	8,480	7,090	2,940	1,530	2,150	1,920
3.....	2,730	7,620	2,970	13,200	2,310	10,200	7,920	9,500	3,150	1,530	1,280	5,340
4.....	3,640	6,670	3,400	9,020	2,990	8,540	8,480	7,940	2,540	1,240	1,200	13,300
5.....	3,460	5,770	3,580	6,250	3,170	8,540	10,700	9,260	2,920	1,410	1,040	6,060
6.....	2,980	4,720	4,520	4,680	2,990	9,510	13,200	9,180	2,470	1,210	1,170	4,420
7.....	5,400	4,240	3,740	4,390	2,870	7,260	14,600	7,540	2,730	1,130	2,100	3,140
8.....	6,350	3,980	4,100	4,110	2,690	5,660	15,000	8,950	2,470	980	2,240	2,510
9.....	4,250	3,460	5,230	5,170	2,470	6,170	14,300	7,590	2,370	850	1,720	2,650
10.....	3,950	3,830	6,770	4,250	2,140	14,100	15,500	7,850	2,370	1,100	1,760	2,260
11.....	3,040	3,150	6,700	3,170	2,030	13,200	16,700	14,900	2,170	2,910	1,330	2,320
12.....	2,650	3,140	6,500	2,580	2,090	9,870	25,400	17,000	2,180	2,400	1,360	2,490
13.....	2,510	3,220	5,610	2,410	2,250	8,060	28,300	17,900	1,870	2,130	1,300	2,040
14.....	2,350	3,260	5,330	2,810	2,410	7,740	21,500	13,000	1,630	1,640	1,440	2,100
15.....	2,620	2,790	8,320	3,550	3,050	6,620	15,500	9,430	2,090	1,460	1,290	1,800
16.....	2,510	2,960	12,100	4,050	4,250	5,660	12,800	7,790	3,370	1,970	1,340	1,650
17.....	2,360	2,730	9,890	4,110	3,670	6,330	9,490	7,310	3,480	1,970	1,220	1,940
18.....	2,520	4,890	8,800	3,860	3,050	13,500	12,300	9,700	3,020	2,340	1,190	1,890
19.....	2,150	7,810	4,350	3,860	2,810	15,700	9,690	12,200	1,850	1,770	2,310	1,750
20.....	2,230	7,660	3,080	3,800	2,410	12,300	8,290	9,280	1,930	1,270	1,520	1,760
21.....	7,530	6,420	4,490	3,800	2,690	12,300	6,840	7,930	1,870	1,170	1,490	1,480
22.....	7,150	5,420	4,340	3,800	2,750	12,500	6,400	7,480	1,860	2,640	1,700	1,580
23.....	4,840	5,220	7,470	3,800	2,690	11,200	5,910	9,430	1,770	5,830	1,560	2,040
24.....	4,080	3,970	12,300	4,960	2,810	9,180	6,340	9,510	1,580	3,640	1,540	3,200
25.....	3,270	4,150	16,800	6,250	2,810	8,700	6,510	8,980	1,340	2,310	2,400	2,420
26.....	3,780	4,150	17,700	6,470	3,490	9,100	6,880	8,780	1,240	2,400	1,870	2,060
27.....	7,260	3,470	11,500	5,380	3,350	8,440	6,700	6,620	1,500	2,150	1,560	2,150
28.....	5,630	3,450	8,160	4,820	3,550	9,660	5,610	6,130	1,760	6,560	1,870	2,340
29.....	4,940	3,120	5,890	4,470	......	14,200	6,700	4,600	2,040	5,730	1,560	1,940
30.....	4,520	4,520	4,490	4,110	......	11,500	6,690	3,690	1,780	3,390	1,400	2,200
31.....	17,600	......	4,340	3,800	......	10,300	......	2,930	......	2,800	2,120	......

NOTE.— Discharge for May 31, taken from Vischer Ferry record.

Monthly discharge of Mohawk River at Crescent Dam, for the year ending September 30, 1919
[Drainage area, 3,490 square miles]

MONTH	DISCHARGE IN SECOND-FEET				RUN-OFF
	Maximum	Minimum	Mean	Per square mile	Depth in inches on drainage area
October	17,600	2,150	4,320	1.24	1.43
November	15,900	2,730	5,060	1.45	1.62
December	17,700	2,900	6,750	1.93	2.22
January	13,200	2,410	4,880	1.40	1.61
February	4,250	2,030	2,850	.817	.85
March	15,700	5,660	9,810	2.81	3.24
April	28,300	5,610	11,400	3.27	3.65
May	17,900	2,930	8,870	2.54	2.93
June	3,480	1,240	2,250	.645	.72
July	6,560	850	2,280	.653	.75
August	2,420	1,040	1,630	.467	.54
September	13,300	1,480	2,830	.811	.91
The year	28,300	850	5,260	1.51	20.47

WEST CANADA CREEK AT HINCKLEY

Location.—About a mile below Hinckley dam, and one quarter of a mile below railroad bridge of New York Central Railroad on west bank of creek.

Drainage area.— 373 square miles (measured on U. S. G. S. topographic maps).

Records available.— June 14, 1919, to September 30, 1919.

Gage.— Gurley 7-day graph water-stage recorder on the right bank, about 1 mile below Hinckley dam installed June 14, 1919. Recorder inspected by W. H. Thomas, gate tender at State dam.

Discharge measurements.— Made from cable located about one thousand feet up stream from gage.

Channel and control.— Large boulders on solid rock bottom; practically permanent.

Extremes of discharge.— Maximum stage from water-stage recorder, 4.32 feet several times in September (discharge 798 second-feet); minimum stage from water-stage recorder 2.53 feet at 12:30 P. M. August 31 (discharge 8 second-feet) — due to closing of gates in dam.

Ice.— Stage-discharge relation not affected by ice.

Regulation.— Seasonal flow regulated by storage in Hinckley reservoir. Diurnal flow affected slightly at low stages by operation of the Fibre Company mill at Hinckley.

Diversions.— Consolidated Water Company of Utica diverts water supply for Utica from Hinckley reservoir.

Accuracy.— Stage-discharge relation permanent. Rating curve well defined between 100 and 2,000 second-feet. Daily discharge ascertained by applying mean daily gage height to rating table. Results good.

Cooperation.— Station installed by Utica Gas and Electric Company. Maintained by United States Geological Survey is cooperation with the State Engineer and Surveyor and State Conservation Commission.

Discharge measurements of West Canada Creek at Hinckley, during the year ending September 30, 1919.

DATE	Made by	Gage height	Discharge
		Feet	*Sec.-ft.*
June 4	J. W. Moulton	3.99	638
14	M. H. Carson	3 90	489
27	J. W. Moulton	3.81	417
29	do	4.12	652
29	do	3.48	278
29	do	3.04	112
Sept. 24	C. C. Covert	4.30	780
24	do	4.30	742

Daily discharge, in second-feet, of West Canada Creek at Hinckley, for the year ending Sept. 30, 1916

DAY	June	July	Aug.	Sept.	DAY	June	July	Aug.	Sept.
1	......	434	468	204	16	479	451	484	700
2	......	434	456	538	17	479	451	484	700
3	......	434	434	550	18	479	456	502	700
4	......	434	445	660	19	473	451	496	700
5	......	445	440	700	20	404	445	490	700
6	......	445	445	700	21	418	451	490	700
7	......	451	462	700	22	413	451	490	700
8	......	445	473	700	23	418	445	331	780
9	......	445	479	660	24	418	451	532	780
10	......	462	484	660	25	418	451	538	780
11	......	445	490	660	26	424	456	526	780
12	......	451	490	660	27	440	456	526	780
13	......	451	490	700	28	440	462	526	780
14	473	456	484	700	29	386	468	665	780
15	473	456	484	700	30	440	468	156	780
					31	......	473	75	......

Monthly discharge of West Canada Creek at Hinckley, for the year ending September 30, 1919.
[Drainage area, 373 square miles]

MONTH	DISCHARGE IN SECOND-FEET				RUN-OFF
	Maximum	Minimum	Mean	Per square mile	Depth in inches on drainage area
July	473	434	451	1.21	1.40
August	665	75	462	1.24	1.43
September	780	204	688	1.84	2.05

NINE MILE FEEDER NEAR HOLLAND PATENT

Location.—At mouth of Nine Mile Feeder about 4 miles east of Holland Patent, Oneida County, half a mile below highway bridge near farm of P. A. Wade, which is about 4 miles south and 1 mile west of village of Barneveld.

Records available.— June 5, 1919, to September 30, 1919.

Gage.— Gurley 7-day graph water-stage recorder on right bank, half a mile below highway bridge near farm of P. A. Wade. Recorder inspected by P. A. Wade.

Discharge measurements.— Made from highway bridge half a mile upstream from gage.

Control.— Suppressed weir of concrete with a lip about 1.5 feet high and a spillway inclined about 1:2. Permanent.

Regulation.— Flow in the feeder is regulated by gates at the intake of the canal just below the power plant at Trenton Falls.

Diversions.— None.

Ice.— Feeder canal not in operation during winter months.

Accuracy. Daily discharge ascertained by applying mean daily gage heights to rating table, or for days of considerable fluctuation by discharge integration. Rating table well defined between 75 and 125 second-feet. Results good.

Cooperation.— United States Geological Survey in cooperation with State Engineer and Surveyor.

Discharge measurements of Nine-Mile Feeder Canal, near Holland Patent, during the year ending September 30, 1919

DATE	Made by	Gage height	Discharge
		Feet	*Sec.-ft.*
June 5	M. H. Carson	1.72	104
14	do	1.585	93.4
28	do	1.50	89.8
July 19	O. W. Hartwell	1.48	83.9
19	M. H. Carson	1.45	82.6
20	O. W. Hartwell	1.84	118
20	M. H. Carson	1.84	118

Daily discharge, in second-feet, of Nine Mile Feeder near Holland Patent, for the year ending September 30, 1919

DAY	June	July	Aug.	Sept.	DAY	June	July	Aug.	Sept.
1	......	85	......	80	16	94	86	125	126
2	......	85	......	87	17	94	85	124	125
3	......	85	97	97	18	94	85	127	124
4	......	85	120	93	19	93	85	125	123
5	......	86	124	88	20	92	102	125	123
6	105	85	124	84	21	92	100	124	122
7	101	85	123	83	22	90	99	123	123
8	102	85	123	81	23	91	98	115	120
9	101	84	124	80	24	90	97	102	118
10	95	92	124	79	25	90	96	120	116
11	93	88	125	78	26	90	......	120	114
12	94	85	126	77	27	92	......	120	113
13	94	85	126	80	28	86	......	115	112
14	94	85	125	126	29	85	......	112	110
15	94	90	125	127	30	86	......	95	109
					31	......	......	76	......

Note:—Record of daily discharge missing July 26 to August 2, inclusive, because recording gage was out of commission.

EAST BRANCH OF DELAWARE RIVER AT FISH EDDY

Location.—At railway bridge in village of Fish Eddy, Delaware County, about 4 miles below mouth of Beaver Kill and 5½ miles above confluence of East and West Branches.

Drainage area.— 790 square miles (measured on post-route map).

Records available.— November 19, 1912, to September 30, 1919. Records were obtained at Hancock, about 4 miles below, from October 14, 1902, to December 31, 1912.

Gage.— Staff, in two sections, on downstream end of left pier of railroad bridge; read by J. P. Lyons.

Discharge measurements.— Made by wading or from the highway bridge about 200 feet above the gage.

Channel and control.— Coarse gravel; occasionally shifting.

Extremes of discharge.— Maximum stage recorded during year, 8.4 feet at 4 P. M. April 12 (discharge 8,390 second-feet); minimum stage recorded, 2.18 feet at 6 P. M. June 26 (discharge 292 second-feet).

1912–1919: Maximum stage, 17.4 feet during the afternoon of March 27, 1913, determined by leveling from flood marks (discharge about 33,500 second-feet); minimum stage recorded, 1.64 feet at 5 P. M. October 12, 14 and 15, 1914 (discharge 97 second-feet).

Ice.— Stage-discharge relation affected by ice.

Accuracy.— Stage-discharge relation apparently permanent; usually affected by ice during much of the period from December to March, inclusive. Rating curve well defined between 200 and 20,000 second-feet. Gage read to hundredths twice daily. Daily discharge ascertained by applying mean daily gage height to rating table. Records good except for periods when the stage-discharge relation was affected by ice, for which they are fair.

Cooperation.— Gage-height record obtained in cooperation with United States Weather Bureau.

Discharge measurements of East Branch of Delaware River at Fish Eddy, during the year ending September 30, 1919

DATE	Made by	Gage height	Discharge
		Feet	*Sec.-ft.*
Mar. 15	J. W. Moulton	4.25	1,770
May 8	do	3.92	1,480
Aug. 26	A. H. Davison	2.57	432
26	do	2.56	437

Daily discharge, in second-feet, of East Branch of Delaware at Fish Eddy, for the year ending September 30, 1919

DAY	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1.....	920	1,080	650	2,100	1,000	3,180	2,200	2,100	650	362	1,040	430
2.....	850	1,080	650	5,440	920	3,320	2,000	2,210	590	362	850	408
3.....	710	1,080	650	3,910	920	2,550	1,690	2,100	560	340	815	408
4.....	710	1,040	590	2,670	850	2,210	2,100	1,890	560	340	650	3,180
5.....	710	1,000	505	2,430	850	2,210	3,050	1,690	530	300	620	2,790
6.....	2,920	1,000	430	2,100	780	2,100	3,610	1,690	530	320	745	2,210
7.....	2,550	920	430	1,890	710	2,100	3,460	1,500	505	430	2,920	1,890
8.....	2,100	920	430	1,790	590	1,890	3,320	1,410	505	385	2,100	1,500
9.....	1,890	850	480	1,790	530	3,180	3,180	2,210	480	362	1,360	1,500
10.....	1,590	780	530	1,690	505	3,050	3,320	3,320	480	385	1,320	1,320
11.....	1,500	780	590	1,690	480	2,320	4,230	4,730	480	362	745	1,160
12.....	1,320	680	590	1,690	455	1,890	8,180	4,560	480	340	590	850
13.....	1,320	590	850	1,690	455	1,690	7,360	4,390	430	340	530	590
14.....	1,320	530	1,320	1,590	1,080	1,690	4,560	4,230	430	340	480	590
15.....	1,160	530	3,460	1,590	920	1,690	4,390	3,180	1,160	340	455	590
16.....	1,040	530	2,790	1,410	920	1,690	4,560	2,550	1,320	340	408	590
17.....	920	590	2,320	1,240	850	1,890	4,900	2,320	920	320	385	560
18.....	850	780	2,210	1,080	620	3,610	4,230	3,050	850	300	430	530
18.....	850	780	2,100	1,080	590	3,460	4,230	2,670	680	1,080	385	530
20.....	920	780	1,690	1,080	590	3,320	3,610	2,550	560	1,500	385	505
21.....	1,000	710	1,320	1,000	560	3,050	2,790	2,320	530	1,500	362	530
22.....	1,080	710	1,320	1,000	530	2,790	2,790	2,550	505	6,380	362	505
23.....	1,080	710	6,380	1,160	505	2,210	1,890	3,050	430	5,260	745	530
24.....	1,160	710	7,160	2,920	505	1,990	1,790	2,670	300	4,900	620	680
25.....	1,240	710	3,320	2,100	505	1,990	1,690	2,100	300	4,560	560	590
26.....	1,160	710	2,790	1,690	505	1,890	1,500	1,790	300	3,320	530	530
27.....	1,080	710	2,210	1,320	505	3,910	1,500	1,690	480	3,910	530	480
28.....	1,080	680	2,100	1,160	590	4,230	1,410	1,690	850	2,670	530	480
29.....	1,080	650	1,890	1,080	......	3,760	1,410	1,590	560	2,210	480	430
30.....	1,080	650	1,790	1,000	......	2,430	1,590	1,410	505	1,990	455	385
31.....	1,080	......	1,790	1,000	......	2,320	......	960	......	1,690	430	......

NOTE.— Stage-discharge relation not affected by ice. Gage height estimated by observre October 20 to 26. Discharge estimated April 1 to 2, by comparing with hydrograph of West Branch Delaware, Hale Eddy.

Monthly discharge of East Branch of Delaware River at Fish Eddy for the year ending Sept. 30, 1919
[Drainage area, 790 square miles]

MONTH	DISCHARGE IN SECOND-FEET				RUN-OFF
	Maximum	Minimum	Mean	Per square mile	Depth in inches on drainage area
October	2,920	710	1,230	1.56	1.80
November	1,080	530	776	.980	1.09
December	7,160	430	1,780	2.25	2.59
January	5,440	1,000	1,790	2.27	2.62
February	1,080	455	672	.851	.89
March	4,230	1,690	2,570	3.25	3.75
April	8,180	1,410	3,220	4.08	4.55
May	4,730	960	2,460	3.11	3.58
June	1,320	300	582	.737	.82
July	6,380	300	1,520	1.92	2.21
August	2,920	362	736	.932	1.07
September	3,180	385	909	1.15	1.28
The year	8,180	300	1,530	1.94	26.25

DELAWARE RIVER AT PORT JERVIS

Location.—At toll bridge at Port Jervis, Orange County, 1 mile above Neversink River and 6 miles below Mongaup River.

Drainage area.— 3,250 square miles.

Records available.— October 12, 1904, to September 30, 1919.

Gage.— Staff in two sections; the upper section vertical and attached to downstream end of left abutment; the lower section inclined about 30 feet downstream; read by John Bisland.

Discharge measurements.— Made from the highway bridge or by wading.

Channel and control.— Gravel; occasionally shifting.

Extremes of discharge.— Maximum stage recorded during year, 7.12 feet at 5 P. M. March 10 (discharge 21,300 second-feet); minimum stage recorded, 1.5 feet at 8 A. M. and 5 P. M. July 9 (discharge 685 second-feet).

1904–1919: Maximum stage recorded, 16.0 feet at 8 A. M. March 28, 1914 (discharge, 92,700 second-feet); minimum stage recorded, 0.60 foot at 8 A. M. September 22 and 23, 1908 (discharge, 175 second-feet).

Ice.— Stage-discharge relation somewhat affected by ice.

Accuracy.— Stage-discharge relation practically permanent; usually affected by ice during large part of January and February. Rating curve well defined between 1,000 and 30,000 second-feet. Gage read to hundredths twice daily. Daily discharge ascertained by applying mean daily gage height to rating table. Records good for periods when the stage-discharge relation was not affected by ice and fairly good for other periods.

Cooperation.— Gage height record obtained in cooperation with United States Weather Bureau.

Discharge measurements of Delaware River at Port Jervis, during the year ending September 30, 1919

DATE	Made by	Gage height	Discharge
		Feet	*Sec.-ft.*
May 10........	J. W. Moulton..	3.80	5,310
June 25........	C. C. Covert..	2.12	1,360
Aug. 28........	A. H. Davison..	2.42	1,820

Daily discharge, in second-feet, of Delaware River at Port Jervis, for the year ending Sept. 30, 1919

DAY	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1.....	2,920	7,810	2,470	5,680	3,650	7,060	7,430	4,750	3,400	1,550	2,690	1,470
2.....	2,690	6,350	2,070	7,430	3,910	16,200	6,350	5,360	2,920	1,390	2,920	1,390
3.....	2,470	5,050	1,980	12,600	2,470	11,600	6,010	7,060	2,690	1,110	2,470	1,470
4.....	2,690	4,460	1,980	10,300	2,260	9,010	5,680	6,010	2,470	1,050	1,980	6,500
5.....	2,920	3,400	1,980	7,430	2,690	7,810	7,430	5,050	2,260	935	1,890	10,300
6.....	3,160	4,460	1,800	5,360	2,690	7,810	8,200	4,750	2,070	1,050	1,980	2,920
7.....	13,100	3,910	1,720	5,680	2,260	7,810	8,600	4,460	2,470	1,180	9,840	2,260
8.....	8,600	3,910	1,640	6,700	1,890	6,700	8,600	4,460	2,470	1,110	7,810	1,890
9.....	6,010	2,920	1,890	6,700	1,890	7,810	9,420	4,460	2,470	685	4,460	1,720
10.....	4,750	2,690	2,070	5,680	1,720	20,500	9,010	7,060	2,070	1,110	3,160	1,550
11.....	4,180	2,470	1,800	4,180	1,550	15,100	7,810	15,700	1,980	1,050	2,690	1,980
12.....	3,910	2,470	1,800	3,910	1,550	12,100	16,200	14,600	1,890	1,050	2,260	2,070
13.....	3,650	2,260	2,260	3,400	1,550	10,300	19,200	13,100	1,720	1,110	1,980	2,260
14.....	3,400	2,070	2,690	3,400	1,980	8,200	14,100	12,100	1,550	1,320	2,070	2,070
15.....	2,920	1,980	4,180	3,650	3,400	6,700	11,600	9,840	1,550	1,110	2,470	1,720
16.....	2,690	1,890	8,600	4,180	4,750	6,700	6,350	8,600	3,400	990	2,690	1,550
17.....	2,470	1,800	7,430	3,650	4,180	8,200	16,800	8,200	3,400	990	2,470	1,470
18.....	2,260	2,470	6,010	3,650	3,650	10,700	15,700	10,300	3,160	1,110	2,260	1,470
19.....	1,980	3,910	4,750	3,650	2,690	13,600	12,100	9,010	2,690	1,640	2,470	1,640
20.....	1,890	4,460	3,910	3,400	1,980	10,700	10,700	7,430	2,070	2,260	3,160	1,640
21.....	1,720	3,910	3,910	2,920	1,980	9,010	8,600	7,060	2,070	3,650	2,690	1,180
22.....	1,720	3,400	3,910	2,920	1,890	8,600	8,200	12,100	2,260	7,430	2,070	1,110
23.....	2,690	2,920	9,010	2,920	2,260	7,810	7,060	8,200	1,890	12,100	1,980	1,470
24.....	2,470	2,690	12,600	5,680	2,260	7,060	6,350	9,420	1,550	8,600	1,980	2,070
25.....	2,070	2,690	14,100	8,600	2,260	6,350	6,350	8,200	1,390	6,350	2,470	2,260
26.....	2,070	2,470	15,100	6,700	2,690	5,680	6,350	7,430	1,720	4,460	2,260	2,260
27.....	2,260	2,260	10,700	6,350	2,920	5,050	5,680	6,350	1,720	4,180	1,890	1,890
28.....	2,260	2,070	8,600	5,360	2,690	7,810	5,360	5,680	2,070	4,750	1,890	1,720
29.....	2,260	2,260	7,430	4,750	.....	10,300	5,360	4,750	2,070	4,750	1,720	1,550
30.....	2,260	2,470	7,060	4,460	.....	8,200	5,360	4,180	1,980	3,650	1,640	1,390
31.....	3,160	.....	5,680	4,180	.....	8,200	.....	3,650	.....	2,920	1,550	....

NOTE.— Discharge estimated September 4 and 5, by comparing with hydrograph of sum of east and west branches. Stage-discharge relation not affected by ice.

Monthly discharge of Delaware River at Port Jervis, for the year ending September 30, 1919
[Drainage area, 3,250 square miles]

MONTH	DISCHARGE IN SECOND-FEET				RUN-OFF
	Maximum	Minimum	Mean	Per square mile	Depth in inches on drainage area
October	13,100	1,720	3,340	1.03	1.19
November	7,810	1,800	3,260	1.00	1.12
December	15,100	1,640	5,200	1.60	1.84
January	12,600	2,920	5,340	1.64	1.89
February	4,750	1,550	2,560	.788	.82
March	20,500	5,050	9,310	2.86	3.30
April	19,200	5,360	9,070	2.79	3.11
May	15,700	3,650	7,720	2.38	2.74
June	3,400	1,390	2,250	.692	.77
July	12,100	685	2,790	.858	.99
August	9,840	1,550	2,770	.852	.98
September	10,300	1,110	2,210	.680	.76
The year	20,500	685	4,670	1.44	19.51

BEAVER KILL AT COOKS FALLS

Location.—At covered highway bridge in Cooks Falls, Delaware County.

Drainage area.— 236 square miles (measured on post-route topographic maps).

Records available.— July 25, 1913, to September 30, 1919.

Gage.— Vertical staff in two sections, bolted to rock on left bank under the bridge; read by H. B. Couch.

Discharge measurements.— Made from the bridge or by wading a short distance downstream.

Channel and control.— Coarse gravel, boulders, and solid ledge; practically permanent.

Extremes of discharge.— Maximum stage recorded during year 7.5 feet at 11 A. M. July 22 (discharge 3,720 second-feet); minimum stage recorded, 1.26 feet at 11 A. M. and 7 P. M. July 18 (discharge, 86 second-feet).

1913–1919: Maximum stage, recorded 12.4 feet, at 5 P. M. October 30, 1917 (discharge about 9,700 second-feet); minimum stage recorded, 0.70 foot from 7 A. M. October 12 to 7 A. M. October 13, 1916 (discharge, 30 second-feet).

Ice.— Stage-discharge relation somewhat affected by ice.

Accuracy.— Stage-discharge relation practically permanent; usually affected by ice during portions of the period December to March, inclusive. Rating curve well defined between 50 and 4,500 second-feet. Gage read to half-tenths twice daily. Daily discharge ascertained by applying mean daily gage height to rating table. Records good for periods when the stage-discharge relation was not affected by ice; fair for other periods.

Discharge measurements of Beaver Kill at Cooks Falls, during the year ending September 30, 1919

DATE	Made by	Gage height	Discharge
		Feet	*Sec.-ft.*
Mar. 15 [a]	J. W. Moulton	2.88	522
May 9	do	2.73	458
Aug. 27	A. H. Davison	1.64	157
27	do	1.65	159

[a] Anchor ice running.

Daily discharge, in second-feet, of Beaver Kill at Cooks Falls, for the year ending September 30, 1918

DAY	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1.....	186	1,730	371	200	130	*b*	1,240	750	415	167	68	212
2.....	186	1,400	355	190	130	*b*	1,690	660	330	167	64	106
3.....	175	1,080	355	190	120	*b*	1,690	570	287	136	61	68
4.....	244	805	325	190	120	*b*	1,830	530	261	146	59	61
5.....	269	705	310	190	120	*b*	1,180	490	261	136	74	58
6.....	208	615	282	190	110	*b*	950	450	236	119	66	57
7.....	186	282	256	200	110	*b*	850	415	315	119	60	58
8.....	175	404	244	190	110	*b*	750	330	287	119	58	57
9.....	220	325	232	190	110	805	1,300	315	224	115	58	57
10.....	164	310	220	200	110	830	1,360	315	224	136	58	55
11.....	154	296	200	200	*a*	805	1,180	315	200	146	103	56
12.....	310	282	200	200	*a*	755	1,000	301	315	136	97	56
13.....	244	296	200	200	*a*	855	850	315	301	156	82	65
14.....	340	296	200	200	*a*	1,020	950	490	248	224	66	58
15.....	355	296	200	200	*a*	755	1,240	615	224	274	105	56
16.....	310	269	190	200	*a*	705	1,300	450	189	156	75	55
17.....	256	282	200	200	*a*	855	1,120	415	178	136	65	54
18.....	232	325	200	200	*a*	1,260	1,830	380	167	136	59	56
19.....	232	310	200	200	*a*	1,730	1,300	345	167	115	58	106
20.....	530	296	200	190	*a*	2,240	1,000	345	148	105	56	89
21.....	490	282	200	180	*a*	2,720	1,690	380	136	95	54	274
22.....	325	404	200	180	*a*	3,310	2,590	345	800	91	53	146
23.....	282	1,140	190	170	*a*	2,960	1,620	345	362	85	53	114
24.....	530	615	186	170	*a*	2,160	1,300	315	287	81	52	100
25.....	910	371	197	170	*a*	1,940	1,060	301	224	79	98	91
26.....	570	355	197	160	*a*	1,660	850	415	200	77	60	490
27.....	1,590	340	208	160	*a*	1,400	750	380	167	74	55	850
28.....	1,260	325	197	160	*a*	1,020	660	345	156	69	53	450
29.....	1,940	340	200	150	*a*	910	660	287	156	71	64	287
30.....	7,110	387	200	140	*a*	1,260	750	415	146	70	60	236
31.....	2,400	......	200	130	*a*	1,260	......	490	......	76	53	......

NOTE.— Discharge December 11 to 23 and December 29 to February 10 estimated, because of ice, from discharge measurements, weather records, study of gage height graph and comparison with similar studies for East Branch Delaware River, Fish Eddy. Mean discharge February 11 to 28 inclusive estimated 584 second-feet. Mean discharge March 1 to 8 inclusive estimated 1370 second-feet. April 1 to September 30 data revised and supersedes data previously published.

a Estimated mean flow, 584 sec.-feet. *b* Estimated flow, 1,370 sec.-feet.

Daily discharge, in second-feet, of Beaver Kill at Cooks Falls, for the year ending September 30, 1919

DAY	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1.....	224	750	274	615	261	2,910	660	530	300	126	415	146
2.....	212	570	236	1,760	261	1,060	570	1,000	274	119	330	189
3.....	380	530	236	1,060	261	705	615	750	261	108	287	490
4.....	274	450	236	1,060	301	660	750	650	248	102	261	660
5.....	248	450	224	850	261	800	850	570	224	92	236	345
6.....	530	415	189	705	248	900	1,420	530	236	136	490	274
7.....	660	362	156	615	236	850	1,060	490	248	146	1,420	224
8.....	450	330	189	660	224	660	1,000	450	230	113	750	200
9.....	345	301	236	570	212	2,040	950	490	212	95	490	178
10.....	301	287	200	530	200	1,690	850	1,120	189	124	380	178
11.....	274	274	212	450	156	1,180	1,000	1,300	167	167	345	212
12.....	261	261	236	450	189	900	2,430	1,060	156	126	287	212
13.....	261	248	212	362	200	750	1,240	1,000	146	105	274	178
14.....	261	236	236	330	236	705	1,180	800	136	97	287	167
15.....	236	224	1,120	380	315	530	1,000	750	400	91	287	146
16.....	224	146	1,060	362	224	530	1,420	705	570	105	261	146
17.....	212	112	750	345	189	570	2,110	950	330	100	274	167
18	200	301	615	345	212	1,420	1,420	950	236	86	287	146
19	200	415	490	345	136	1,060	1,180	850	189	850	274	126
20.....	189	362	415	248	146	850	950	705	189	800	248	122
21.....	950	315	345	236	189	850	850	750	212	1,000	212	122
22.....	415	301	415	570	189	800	750	750	200	3,260	212	122
23.....	345	261	2,590	236	167	750	660	1,000	136	1,550	200	224
24.....	301	261	1,300	1,060	167	705	615	750	126	900	200	189
25.....	274	248	2,430	615	136	615	615	660	122	705	200	156
26.....	287	248	1,550	570	287	570	800	615	124	570	167	136
27.....	315	236	1,180	450	189	570	615	530	345	1,360	156	124
28.....	301	236	950	380	189	1,690	615	450	315	705	189	112
29.....	287	345	750	362	......	1,120	570	450	285	570	167	105
30.....	345	315	660	345	......	950	530	380	156	415	146	102
31.....	1,060	......	570	315	......	750	......	330	......	345	146	......

Monthly discharge of Beaver Kill at Cooks Falls, for the year ending September 30, 1918.
[Drainage area, 236 square miles]

MONTH	DISCHARGE IN SECOND-FEET				RUN-OFF
	Maximum	Minimum	Mean	Per square mile	Depth in inches on drainage area
October	7,110	154	722	3.06	3.53
November	1,730	269	505	2.14	2.39
December	371	176	230	.975	1.12
January	200	130	184	.780	.90
February	....	....	417	1.77	1.84
March	3,310	705	1,420	6.02	6.94
April	2,590	600	1,220	5.17	5.77
May	750	287	414	1.75	2.02
June	800	136	250	1.06	1.18
July	274	69	123	.521	.60
August	105	52	66	.280	.32
September	850	54	149	.631	.70
The year	7,110	52	475	2.01	27.31

NOTE.— Data revised for period April 1 to September 30, on basis of additional measurements.

Monthly discharge of Beaver Kill at Cooks Falls, for the year ending September 30, 1919.
[Drainage area, 236 square miles]

MONTH	DISCHARGE IN SECOND-FEET				RUN-OFF
	Maximum	Minimum	Mean	Per square mile	Depth in inches on drainage area
October	1,060	189	349	1.48	1.71
November	750	112	326	1.38	1.54
December	2,590	156	654	2.77	3.19
January	1,760	236	554	2.35	2.71
February	315	136	214	.911	.95
March	2,910	530	972	4.12	4.75
April	2,430	530	976	4.14	4.62
May	1,300	330	720	3.05	3.52
June	570	122	232	.983	1.10
July	3,260	86	486	2.06	2.38
August	1,420	146	319	1.35	1.56
September	660	102	197	.835	.93
The year	3,260	86	503	2.13	28.96

WEST BRANCH OF DELAWARE RIVER AT HALE EDDY

Location.—At highway bridge in village of Hale Eddy, Delaware County, 8 miles below power dam of Deposit Electric Co. and 8½ miles above junction with East Branch of Delaware River.

Drainage area.— 611 square miles (measured on post-route map).

Records available.— November 15, 1912, to September 30, 1919. Records obtained at Hancock, about 7 miles below, from October 15, 1902, to December 31, 1912.

Gage.— Vertical staff, in four sections, attached to rocks near the right abutment of the bridge and to the abutment; read by W. J. Shanly.

Discharge measurements.— Made from the cable, installed in July, 1916, about 400 feet below the gage. Previous measurements made from the highway bridge or by wading.

Channel and control.— Coarse gravel and boulders; practically permanent.

Extremes of discharge.— Maximum stage recorded during year, 7.5 feet at 4 P. M. April 12 (discharge, 5,420 second-feet); minimum stage recorded, 1.50 feet at 4 P. M. July 9 (discharge, 65 second-feet).

1912–1919: Maximum stage recorded[1] 15.3 feet at 5 P. M. March 27, 1913 (discharge about 25,000 second-feet); minimum stage recorded, 1.0 foot at 6 P. M. September 21, 1913 (discharge, 34 second-feet).

Ice.— Stage-discharge relation affected by ice.

Accuracy.— Stage-discharge relation practically permanent. Rating curve well defined between 300 and 18,000 second-feet. Gage read to half-tenths twice daily. Daily discharge ascertained by applying mean daily gage height to rating table. Records good for periods when the stage-discharge relation was not affected by ice; fair for other periods.

Discharge measurements of West Branch of Delaware River at Hale Eddy, during the year ending September 30, 1919.

DATE	Made by	Gage height	Discharge
		Feet	*Sec.-ft.*
Oct. 12........	C. C. Covert..	3.65	1,010
Dec. 24........	do	4.44	1,550
Jan. 22 *a*......	do	2.94	560
May 8........	J. W. Moulton..	3.57	855
June 27........	C. C. Covert..	2.14	230
Aug. 26........	A. H. Davison..	2.08	192
26.......	do	2.05	206

a Some shore ice.

Daily dischare in second-feet of West Branch of Delaware River at Hale Eddy, for the yeaar ending September 30, 1919

DAY	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1......	1,040	2,560	455	1,180	690	3,540	1,420	970	480	95	305	170
2......	870	1,940	410	3,280	632	2,340	1,260	970	432	95	200	250
3......	1,180	1,940	480	2,790	580	1,760	1,260	970	388	95	215	285
4......	1,040	1,760	505	2,140	632	1,500	1,940	970	365	85	170	325
5......	1,110	1,420	432	1,670	720	1,420	1,940	970	325	81	142	480
6......	4,810	1,110	365	1,420	632	1,580	2,140	970	305	95	365	305
7......	3,540	1,110	410	1,180	530	1,420	2,240	870	268	95	780	268
8......	2,140	970	432	900	455	1,260	1,940	900	285	95	455	268
9......	1,760	970	530	810	432	2,040	1,940	870	268	75	345	250
10......	1,580	900	530	720	388	3,280	2,140	1,760	250	85	268	200
11......	1,260	870	432	660	305	2,560	2,140	3,410	170	95	232	170
12......	1,040	810	605	632	305	1,940	5,260	3,030	118	118	215	200
13......	1,110	720	530	632	388	1,670	4,080	3,280	118	170	170	170
14......	970	580	840	780	580	1,420	3,280	2,790	105	142	142	185
15......	870	505	1,580	900	1,260	1,260	2,560	2,140	200	170	155	170
16......	690	505	1,670	750	970	1,260	2,140	1,760	200	215	170	155
17......	632	480	1,260	780	605	1,760	2,790	1,760	250	200	118	170
18......	605	1,260	1,180	750	530	2,450	2,140	1,760	305	200	118	200
19......	530	1,180	1,110	690	480	2,140	1,940	1,340	232	200	142	200
20......	530	1,110	970	690	432	1,940	1,580	1,110	232	200	170	200
21......	505	970	970	632	505	1,760	1,420	1,110	268	250	142	170
22......	505	970	970	555	432	1,580	1,260	1,040	200	388	365	118
23......	580	870	2,040	580	455	1,420	1,110	1,340	118	345	388	365
24......	555	780	1,580	1,940	432	1,260	1,110	1,180	118	305	268	690
25......	555	720	2,450	1,580	432	1,110	1,110	1,110	118	215	325	505
26......	555	690	2,140	1,420	632	1,110	1 110	1,040	185	200	250	432
27......	605	632	1 940	1,260	555	1,110	1,110	870	215	690	232	388
28......	580	555	1,670	1,110	580	1,110	1,110	810	215	530	185	345
29......	580	555	1,420	1,040	......	1,670	970	690	185	432	200	305
30......	660	505	1,260	970	......	1,760	970	632	170	345	200	268
31......	3,150	......	1,110	780	......	1,670	......	580	......	305	185	......

NOTE.— Stage-discharge relation not affected by ice.

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[1] The observer states that on October 10, 1893, the water rose to an elevation indicated by a nail in a tree near the gage. This nail is at gage height 20.3 feet. No data available indicating whether the present rating is applicable to this gage height.

Monthly discharge of West Branch of Delaware River at Hale Eddy, for the year ending September 30, 1919

[Drainage area, 611 square miles]

MONTH	Discharge in Second-feet				Run-off
	Maximum	Minimum	Mean	Per square mile	Depth in inches on drainage area
October	4,810	505	1,170	1.92	2.21
November	2,560	480	998	1.63	1.82
December	2,450	365	1,040	1.70	1.96
January	3,280	555	1,140	1.87	2.16
February	1,260	305	556	.910	.95
March	3,540	1,110	1,750	2.86	3.30
April	5,260	970	1,910	3.13	3.49
May	3,410	580	1,390	2.27	2.62
June	480	105	236	.386	.43
July	690	75	213	.349	.40
August	780	118	246	.403	.46
September	690	118	274	.448	.50
The year	5,260	75	913	1.50	20.30

SUSQUEHANNA RIVER AT CONKLIN

Location.—At steel highway bridge just below Conklin, Broome County, 5 miles below Big Snake Creek and 8 miles above Chenango River.

Drainage area.—2,350 square miles.

Records available.—November 13, 1912, to September 30, 1919. Records were obtained at Binghamton, 8 miles below, from July 31, 1901, to December 31, 1912.

Gage.—Gurley 7-day water-stage recorder on left bank just below the highway bridge. Prior to January 21, 1919, a Stevens water-stage recorder operated here. Stevens gage removed because of necessary repairs.

Discharge measurements.—Made from the bridge or by wading.

Channel and control.—Coarse gravel and boulders; probably permanent.

Extremes of discharge.—Maximum stage during year, from water-stage recorder, 10.65 feet at 3 P. M. October 31 (discharge, 17,900 second-feet); minimum stage, from water-stage recorder, 2.27 feet at 4 A. M. September 22 (discharge, 395 second-feet).

1912–1919: Maximum stage recorded, 19.74 feet at the former station in Binghamton at 7:40 A. M. March 2, 1902 (discharge about 62,500 second-feet); minimum stage recorded, 1.32 feet at 8:20 A. M. and 4 P. M. September 16, 1913 (discharge, 106 second-feet).

Ice.—Stage-discharge relation affected by ice.

Accuracy.—Stage-discharge relation practically permanent. Usually affected by ice for a large portion of the period from January to March, inclusive. Rating curve well defined between 250 and 55,000 second-feet. Operation of water-stage recorder fairly satisfactory. Daily discharge ascertained by applying mean daily gage height to rating table, except for days when the mean gage height would not give the discharge within 1 per cent, for such days the discharge is the mean of 24 hourly determinations. Gage heights obtained by inspecting gage height graph or by taking mean of two observations per day. Records good except for periods when the stage-discharge relation was affected by ice, for which they are fair.

Discharge measurements of Susquehanna River at Conklin, during the year ending Sept. 30, 1919

DATE	Made by	Gage height	Discharge
		Feet	*Sec.-ft.*
Jan. 21	E. D. Burchard	4.32	2,390
May 7	J. W. Moulton	5.30	3,990
Aug. 24	A. H. Davison	2.84	700

Daily discharge, in second-feet of Susquehanna River at Conklin, for the year ending Sept. 30, 1919

DAY	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1	2,830	14,000	1,750	3,680	2,510	4,360	4,640	3,590	1,810	650	1,100	579
2	2,750	9,360	1,750	6,400	2,360	9,000	4,040	3,500	1,630	550	1,100	642
3	3,330	6,400	1,880	10,200	2,360	7,100	3,950	3,500	1,460	500	1,060	684
4	3,240	5,380	1,900	8,280	2,280	5,060	5,280	3,590	1,350	480	997	834
5	2,750	4,950	2,200	5,940	2,210	4,640	6,860	3,160	1,240	460	882	914
6	8,380	4,640	2,200	4,640	2,140	5,500	7,330	4,140	1,180	500	1,030	850
7	9,500	4,040	2,200	3,860	2,070	5,060	7,100	4,040	1,100	506	1,630	796
8	5,980	3,590	2,200	4,230	1,750	4,040	7,100	3,860	988	476	2,000	712
9	4,330	3,240	2,200	4,040	1,520	5,050	7,560	4,040	970	470	1,880	656
10	3,500	3,080	2,400	3,500	1,570	8,520	7,330	6,790	962	500	1,400	705
11	2,990	2,830	2,800	2,670	1,460	9,240	7,800	11,500	962	530	1,120	684
12	2,670	2,750	4,000	3,330	1,460	7,100	11,800	12,100	988	500	997	656
13	2,440	2,510	5,500	3,330	1,300	5,600	12,300	11,800	898	458	938	623
14	2,280	2,360	7,000	2,990	1,400	4,950	9,740	10,000	850	727	874	579
15	2,140	2,210	8,000	3,500	2,060	3,950	8,040	7,800	850	628	803	614
16	2,000	2,070	7,000	4,230	3,680	4,430	7,330	6,400	930	586	754	544
17	1,810	1,940	6,000	3,330	2,990	6,730	7,800	5,720	1,040	591	656	572
18	1,690	5,340	5,000	3,330	2,140	9,240	7,800	5,720	1,350	1,440	698	512
19	1,570	7,100	4,000	2,830	2,070	8,760	6,630	5,500	1,070	1,090	684	518
20	1,460	5,940	3,400	3,330	1,880	7,100	5,500	4,430	943	842	893	500
21	1,690	4,640	3,400	2,990	1,690	5,940	4,840	3,800	1,060	850	1,080	464
22	1,940	3,950	6,000	2,440	1,460	5,720	4,330	4,000	1,160	782	1,040	512
23	1,810	35,00	5,600	2,440	1,490	5,170	3,860	5,000	1,350	777	850	565
24	1,570	31,60	5,500	4,500	1,450	4,430	3,500	5,900	1 020	3,150	800	734
25	1,460	28,30	6,000	5,940	1,570	4,040	3,770	4,330	858	2,310	782	670
26	1,400	2,590	6,000	4,740	2,000	3,680	4,040	4,040	754	1,570	726	506
27	1,350	2,440	5,500	3,950	2,210	3,500	3,770	3,500	719	1,540	649	775
28	1,520	2,210	5,000	3,590	1,940	5,280	3,680	2,910	750	2,400	635	684
29	1,460	2,210	4,640	3,240	......	6,170	3,770	2,440	800	1,700	649	656
30	2,170	2,210	3,680	2,990	......	4,530	3,860	2,140	750	1,400	635	600
31	15,100	......	3,500	2,830	......	4,530	......	1,940	......	1,200	586	......

NOTE. — Discharge estimated December 4 to 22, 25 to 28, May 21 to 24, June 28 to July 5. Hydrograph on gage height record intermittent and breaks estimated November 12–16, and 24–27. Chain gage observations made once daily, used December 29 to January 21 inclusive. Stage-discharge relation not affected by ice.

Monthly discharge of Susquehanna River at Conklin, for the year ending September 30, 1919

[Drainage area, 2,350 square miles]

MONTH	DISCHARGE IN SECOND-FEET				RUN-OFF
	Maximum	Minimum	Mean	Per square mile	Depth in inches on drainage area
October	15,100	1,350	3,200	1.36	1.57
November	14,000	1,940	4,120	1.75	1.95
December	8,000	1,750	4,140	1.76	2.03
January	10,200	2,440	4,110	1.75	2.02
February	3,680	1,300	1,960	.834	.87
March	9,240	3,500	5,760	2.45	2.82
April	12,300	3,500	6,180	2.63	2.93
May	12,100	1,940	5,200	2.21	2.55
June	1,810	719	1,060	.451	.50
July	3,150	458	973	.414	.48
August	2,000	586	965	.411	.47
September	914	464	645	.274	.31
The year	15,100	458	3,200	1.36	18.50

CHENANGO RIVER NEAR CHENANGO FORKS

Location.—About 1½ miles below Tioughnioga River, 2 miles by road below Chenango Forks post office, Broome County, and 11½ miles above Binghamton and the mouth.

Drainage area.— 1,420 square miles (revised). See "Diversions."

Records available.— November 11, 1912, to September 30, 1919. Records were obtained at Binghamton July 31, 1901, to December 31, 1911.

Gage.— Stevens water-stage recorder on the left bank on the farm of Erastus Ingraham.

Discharge measurements.— Made from cable, about 100 feet above the gage, or by wading.

Channel and control.— Sand, gravel, and small cobblestones; practically permanent.

Extremes of discharge.— Maximum stage during year, from water-stage recorder, 8.1 feet at 7:50 A. M. October 31 (discharge 11,800 second-feet); minimum stage, from water-stage recorder 2.46 feet at 3 P. M. September 30 (discharge, 194 second-feet).

1901–1919: Maximum stage recorded, 12.18 feet from noon until 1 P. M. April 2, 1916 (discharge, 27,900 second-feet); minimum stage recorded, 4.6 feet at the former station in Binghamton at 8 A. M. August 29, 1909 (discharge about 10 second-feet).

Ice.—Stage-discharge relation affected by ice.

Diversions.— The run-off from 87.3 square miles at head of Chenango River and from 15.7 square miles at head of Tioughnioga River is stored in reservoirs and, except for discharge over the spillways, is diverted out of the drainage area through the Erie Canal. The above-mentioned drainage area for nango River does not include these two areas.

Accuracy.— Stage-discharge relation practically permanent; usually affected by ice for a large part of the period from January to March, inclusive. Rating curve well defined between 120 and 35,000 second-feet. Operation of water-stage recorder fairly satisfactory throughout the year. Daily discharge ascertained by applying to the rating table mean daily gage heights, determined by inspecting gage height graph or for days of considerable fluctuation, by averaging the hourly discharge. Records good except for periods when stage-discharge relation was affected by ice, for which they are fair.

Discharge measurements of Chenango River at Chenango Forks, during the year ending September 30, 1919

DATE	Made by	Gage height	Discharge
		Feet	*Sec.-ft.*
Jan. 21	C. C. Covert	3.63	1,400
May 7	J. W. Moulton	4.35	2,370
12	do	6.69	7,730
June 30	C. C. Covert	2.82	381
Aug. 25	A. H. Davison	2.78	362

Daily discharge, in second-feet, of Chenango River near Chenango Forks, for the year ending Sept. 30, 1919

DAY	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept
1	1,320	9,700	1,090	2,650	1,270	6,480	2,880	2,610	1,340	375	1,120	368
2	1,420	7,370	994	6,830	1,180	5,890	2,700	2,970	1,210	352	970	345
3	1,660	3,350	1,030	5,310	1,260	3,650	2,790	2,700	1,080	338	805	368
4	1,520	2,610	1,140	3,860	1,210	3,060	4,280	2,270	994	322	700	368
5	2,100	2,100	1,220	2,970	1,190	3,450	5,070	2,970	904	309	631	360
6	2,610	1,940	1,220	2,610	1,140	3,750	5,190	2,880	849	360	1,210	322
7	3,160	1,750	1,220	2,610	959	2,700	4,840	2,610	893	360	1,600	303
8	2,970	1,600	1,280	2,520	926	2,330	4,720	3,060	838	368	1,030	267
9	2,440	1,490	1,350	2,520	849	4,600	5,310	2,880	750	338	805	267
10	1,780	1,490	1,490	1,940	904	9,340	5,430	6,690	740	330	670	261
11	1,560	1,490	1,630	1,940	805	6,050	6,700	10,000	720	368	602	255
12	915	1,280	1,940	1,780	860	4,060	9,700	7,650	670	414	520	255
13	945	970	3,750	1,560	794	3,450	8,210	7,370	622	438	496	261
14	772	970	5,550	1,600	1,270	2,790	6,310	5,310	584	382	454	242
15	772	1,160	7,370	1,590	3,550	2,270	4,840	4,030	555	375	430	267
16	750	1,160	6,050	1,530	2,520	2,670	4,170	3,550	521	383	414	261
17	750	2,180	4,840	1,380	1,630	5,800	4,610	3,650	650	1,310	382	255
18	730	8,210	3,750	1,430	1,460	6,310	4,390	4,840	700	816	406	246
19	730	6,570	2,270	1,450	1,180	5,430	3,750	3,450	564	602	521	250
20	730	4,840	1,940	1,360	1,090	3,980	3,160	2,790	564	496	926	250
21	794	3,450	1,860	1,300	1,020	3,550	3,060	2,520	574	487	660	232
22	1,220	2,610	2,240	1,300	959	3,160	2,700	2,520	555	594	496	267
23	970	2,270	4,840	1,460	970	2,610	2,270	4,260	498	3,380	430	285
24	750	2,020	3,860	4,160	982	2,360	2,360	4,960	454	1,720	360	297
25	915	1,690	5,180	3,220	994	2,100	2,880	4,720	430	948	360	285
26	1,070	1,560	5,190	2,520	1,320	1,860	2,610	3,860	422	750	345	273
27	994	1,490	3,650	2,180	1,120	2,000	2,610	2,970	414	4,910	338	255
28	750	1,350	3,060	2,100	1,090	6,190	3,060	2,440	462	7,310	303	242
29	882	1,190	2,520	1,750	......	3,960	3,350	2,020	454	3,170	322	224
30	1,380	1,120	2,520	1,630	......	3,260	3,030	1,700	406	1,860	330	210
31	11,500	......	2,270	1,480	......	3,350	......	1,490	......	1,320	375	......

NOTE.—Stage-discharge relation not affected by ice.

Monthly discharge of Chenango River near Chenango Forks, for the year ending September 30, 1919

[Drainage area, 1,420 square miles]

MONTH	DISCHARGE IN SECOND-FEET				RUN-OFF
	Maximum	Minimum	Mean	Per square mile	Depth in inches on drainage area
October	11,500	730	1,640	1.16	1.34
November	9,700	970	2,700	1.90	2.12
December	7,370	994	2,850	2.01	2.32
January	6,830	1,300	2,340	1.65	1.90
February	3,550	794	1,230	.866	.90
March	9,340	1,860	3,950	2.78	3.20
April	9,700	2,270	4,230	2.98	3.32
May	10,000	1,490	3,800	2.68	3.09
June	1,340	406	680	.479	.53
July	7,310	309	1,140	.803	.93
August	1,600	303	613	.432	.50
September	368	210	278	.193	.22
The year	11,500	210	2,130	1.50	20.37

CHEMUNG RIVER AT CHEMUNG

Location.—At new highway bridge about midway between Chemung, Chemung County, and Willawana, Pa., half a mile upstream from State line and about 10 miles above mouth.

Drainage area.— 2,440 square miles.

Records available.— September 11, 1903, to September 30, 1919.

Gage.— Tape gage at the upstream side of the right span of the bridge; read by D. L. Orcutt.

Discharge measurements.— Made from the bridge or by wading.

Channel and control.— Sand and gravel; occasionally shifting.

Extremes of discharge.— Maximum stage recorded during year, 16.72 feet at 6:30 A. M. May 23 (discharge, 57,900 second-feet); minimum stage recorded, 1.92 feet at 5 P. M. September 29, and at 7 A. M. and 5 P. M. September 30 (discharge, 266 second-feet).

1903–1919: Maximum stage recorded, 17.96 feet at 7 A. M. March 15, 1918 (discharge about 67,000 second-feet); minimum stage recorded, 1.47 feet at 7 A. M. August 14, 1911 (discharge, about 49 second-feet).

Ice.— Stage-discharge relation affected by ice.

Regulation.— Power is developed above the station, the largest plant being at Elmira, N. Y.

Accuracy.— Stage-discharge relation probably permanent, usually affected by ice for a large portion of the period from December to March, inclusive. Rating curve well defined between 200 and 45,000 second-feet. Gage read to hundredths twice daily. Daily discharge ascertained by applying mean daily gage height to rating table. Records good, except for periods when the stage-discharge relation was affected by ice; fair for those periods.

Discharge measurements of Chemung River at Chemung, during the year ending September 30, 1919

DATE	Made by	Gage height	Discharge
		Feet	*Sec.-ft.*
Jan. 22	E. D. Burchard	3.17	1,270
May 6	J. W. Moulton	3.76	1,910
June 29	C. C. Covert	3.34	1,380
Aug. 23	A. H. Davison	3.04	1,090

Daily discharge, in second-feet, of Chemung River at Chemung, for the year ending September 30, 1919.

DAY	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1	930	4,040	960	1,250	790	1,540	3,460	2,140	2,600	915	670	870
2	870	2,440	790	2,760	710	4,240	2,760	2,440	2,140	790	915	710
3	1,150	2,000	870	3,840	710	2,290	2,600	2,290	1,860	710	750	574
4	2,000	1,730	830	2,290	870	2,000	2,930	1,860	1,730	623	609	630
5	1,300	1,540	790	1,600	750	2,000	4,240	1,860	1,540	595	567	532
6	3,460	1,730	790	1,860	670	3,100	4,040	2,000	1,360	630	553	490
7	7,560	1,420	710	2,440	553	2,600	3,460	1,730	2,000	567	1,000	464
8	6,240	1,250	750	2,290	630	2,140	5,300	1,860	2,440	750	960	419
9	4,650	1,150	915	2,290	490	3,280	8,140	2,000	1,860	609	750	383
10	4,040	1,050	1,730	1,860	560	11,400	6,750	12,800	2,930	539	602	354
11	3,650	1,000	1,300	1,600	458	5,530	11,700	28,000	2,140	518	539	332
12	1,420	960	1,200	2,000	497	4,240	14,600	20,000	1,600	710	484	343
13	1,100	915	1.250	2 000	484	3,280	9 380	15 700	1 420	623	444	326
14	1 100	830	1 730	1 540	609	2,600	6,750	9,060	1,150	560	419	332
15	1,000	790	3,840	1,540	1,300	1,860	5,080	6,490	1,050	539	395	343
16	1,050	750	4,240	1,480	1,600	2,000	5,530	5,300	1,000	525	383	326
17	915	710	2,930	1,480	1,100	5,530	8,750	5,300	1,250	1,200	580	321
18	710	3,280	2,290	1,360	1,000	8,140	6,000	8,440	1,250	790	1,360	290
19	670	6,490	1,860	1,480	750	7,560	4,650	4,650	1,000	670	1,660	282
20	630	4,440	1,540	1,250	790	4,650	3,840	6,000	870	630	1,800	288
21	630	3,840	1,420	1,250	870	3,840	3,460	20,000	960	960	1,300	277
22	616	2,600	1,420	1,200	790	3,460	3,280	44,800	1,730	1,860	1,000	277
23	630	2,290	2,000	1,250	750	3,100	2,600	53,500	1,100	3,370	1,000	310
24	581	1,860	2,440	1,360	790	2,440	2,290	32,000	870	2,000	790	377
25	546	1,540	2,140	2,140	790	2,140	2,600	24,800	790	1,300	670	438
26	574	1,360	2,440	1,730	870	1,860	2,290	14,200	710	1,000	750	371
27	543	1,150	2,000	1,540	915	1,730	2,290	9,060	790	830	710	310
28	574	1,050	1,600	1,250	830	5,500	2,290	6,490	2,600	1,480	588	310
29	602	1,000	1,420	1,200	......	4,040	2,440	4,860	1,540	915	560	272
30	630	1,000	1,250	1,150	......	3,460	2,440	3,650	1,100	750	574	266
31	1,860	......	1,100	870	......	4,240	......	3,100	......	670	543	......

NOTE.— Discharge estimated March 28, by comparing with hydrographs of Susquehanna at Conklin and Chenango at Chenango Forks. Stage-discharge relation not affected by ice.

Monthly discharge of Chemung River at Chemung, for the year ending September 30, 1919
[Drainage area, 2,440 square miles]

MONTH	DISCHARGE IN SECOND-FEET				RUN-OFF
	Maximum	Minimum	Mean	Per square mile	Depth in inches on drainage area
October	7,560	546	1,690	.693	.80
November	6,490	710	1,870	.766	.85
December	4,240	710	1,630	.668	.77
January	3,840	870	1,710	.701	.81
February	1,600	458	783	.321	.33
March	11,400	1,540	3,730	1.53	1.76
April	14,600	2,290	4,860	1.99	2.22
May	53,500	1,730	11,500	4.71	5.43
June	2,930	710	1,510	.619	.69
July	3,370	518	923	.378	.44
August	1,800	383	771	.316	.36
September	870	266	394	.161	.18
The year	53,500	266	2,640	1.08	14.64

TIOGA RIVER NEAR ERWINS

Location.—At highway bridge one quarter mile below the mouth of the Canisteo River near the village of Erwins, Steuben County, and about three miles above the junction of the Tioga and Cohocton River to form the Chemung River at the town of Painted Post.

Drainage area.— 1,320 square miles (furnished by Mr. Robert O. Hayt).

Records available.— July 12, 1918, to September 30, 1919.

Gage.— Chain near left abutment, downstream side of bridge; graduated and read to quarter tenths twice daily by Miss Jane Sexton.

Discharge measurements.— Made from bridge and at low stages by wading near the control one hundred yards downstream.

Channel and control.— Well compacted gravel, probably permanent.

Extremes of discharge.— Maximum stage recorded during year 16.4 feet at 4 P. M. May 22 (beyond the limits of present rating curve); minimum stage recorded 1.1 feet at 5:30 P. M. September 29 (discharge 100 second-feet).

1918–1919: Maximum stage recorded 16.4 feet at 4 P. M. May 22, 1919 (beyond the limits of present rating curve); minimum stage recorded 1.0 foot several times in August, 1918 (discharge, 70 second-feet).

Ice.— Stage-discharge relation affected by ice.

Regulation.— There is no considerable storage to interfere with the seasonal flow.

Accuracy.— Stage-discharge relation believed to be fairly permanent; probably affected by ice from December to March. Rating curve well defined below a discharge of 12,000 second-feet.

Cooperation.— Station established by the Lamoka Power Company under the direction of the United States Geological Survey. Maintained by the survey in cooperation with the Power Co. and the State of New York.

Discharge measurements of Tioga River near Erwins, during the year ending September 30, 1919

DATE	Made by	Gage height	Discharge
		Feet	*Sec.-ft.*
Nov. 21	E. D. Burchard	3.38	1,770
21	do	3.36	1,710
Jan. 27	do	2.27	798
Mar. 6	do	3.97	2,680
April 4	J. W. Moulton	3.43	1,920
13	M. H. Carson	4.97	4,300
15	do	3.74	2,170
21	do	3.47	1,900
May 12	J. W. Moulton	8.38	12,000
26	O. W. Hartwell	5.84	5,900

Daily discharge, in second-feet, of Tioga River near Erwins, for the year ending September 30, 1918

DAY	July	Aug.	Sept.	DAY	July	Aug.	Sept.
1	......	138	50	16	100	180	220
2	......	112	90	17	109	180	390
3	......	82	121	18	118	138	1,100
4	......	97	100	19	97	121	900
5	......	146	121	20	106	109	3,920
6	......	562	112	21	118	106	2,340
7	......	200	240	22	127	109	1,380
8	......	190	205	23	118	103	980
9	79	154	170	24	112	88	820
10	......	230	121	25	106	80	660
11	......	548	106	26	154	70	980
12	124	513	112	27	138	65	1,240
13	142	306	146	28	112	60	940
14	130	265	432	29	82	60	700
15	118	220	294	30	94	54	590
				31	94	50	......

Daily discharge, in second-feet, of Tioga River near Erwins, for the year ending September 30, 1919

DAY	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1	562	1,840	625	700	390	2,920	1,620	940	1,200	548	820	660
2	590	1,280	492	3,080	520	1,730	1,330	1,060	1.060	450	740	513
3	1,100	1,060	569	1,730	625	1,330	1,420	980	940	366	548	583
4	1,100	980	534	1,060	478	1,200	1,730	820	860	306	457	478
5	820	1,100	541	625	414	1,100	2,210	980	780	318	420	432
6	4,990	1,020	527	660	408	2,340	1,960	900	700	348	860	408
7	2,340	860	478	820	432	1,420	1 620	820	980	534	940	348
8	1,520	780	534	980	372	1,380	5,370	940	1,100	426	700	312
9	1,150	700	1,420	940	390	3,750	4,990	940	1,240	324	527	270
10	940	660	1,020	900	288	4,990	4,990	12,600	1,100	300	457	260
11	780	625	780	880	270	2,920	5,760	14,400	780	625	396	250
12	700	590	740	860	260	1,960	7,010	11,500	660	485	354	250
13	625	541	820	850	250	1,730	4,090	6,160	583	354	330	260
14	660	520	1,420	850	318	1,240	2,920	3,920	499	342	300	250
15	576	478	2,620	740	1,420	1,100	2,340	2,770	457	294	270	240
16	548	464	1,960	1,200	900	1,150	3,920	2,480	432	1,520	590	215
17	478	432	1,420	1,060	590	3,240	4,450	2,620	660	700	450	205
18	464	6,160	1,150	820	625	5,960	2,770	3,580	541	513	1,840	185
19	408	3,920	1,020	940	414	3,240	2,210	2,210	438	444	1,840	190
20	390	2,210	900	980	625	2,210	1,840	1,730	471	420	1,420	166
21	378	1,730	860	820	492	1,960	1,840	32,500	2,620	1,380	940	138
22	390	1,420	860	740	438	1,730	1,520	38,000	860	2,620	940	235
23	354	1,240	1,840	940	450	1,380	1,280	34,000	625	2,770	820	366
24	342	1,060	1,330	1,960	471	1,200	1,200	13,800	478	1,240	625	348
25	348	940	1,280	1,280	485	1,060	1,200	10,400	414	900	630	250
26	312	820	1,330	1,060	590	980	1,150	5,370	426	740	630	230
27	348	660	1,020	900	513	980	1,200	3,920	1,620	1,840	590	185
28	354	660	980	780	513	3,080	1,150	2,770	1,420	940	541	166
29	366	660	780	780	......	1,960	1,200	2,080	900	740	499	109
30	366	700	700	625	......	1,730	1,100	1,730	660	590	438	100
31	2,480	......	660	506	......	2,340	......	1,420	......	548	940	...

NOTE.— Daily discharge estimated because of no gage height record for January 10 to 14; February 11 to 13; April 25; August 25 to 27, by comparing with hydrograph of Chemung, Chemung, minus Cohocton, Campbell.

Monthly discharge of Tioga River near Erwins, for the year ending September 30, 1918
[Drainage area, 1,320 square miles]

MONTH	DISCHARGE IN SECOND-FEET				RUN-OFF
	Maximum	Minimum	Mean	Per square mile	Depth in inches on drainage area
August	562	50	172	0.130	0.15
September	3,920	50	653	.495	.55

Monthly discharge of Tioga River near Erwins, for the year ending September 30, 1919
[Drainage area, 1,320 square miles]

MONTH	DISCHARGE IN SECOND-FEET				RUN-OFF
	Maximum	Minimum	Mean	Per square mile	Depth in inches on drainage area
October	4,990	312	864	.655	.76
November	6,160	432	1,200	.909	1.01
December	2,620	478	1,010	.765	.88
January	3,080	506	1,000	.758	.87
February	1,420	250	498	.377	.39
March	5,960	980	2,110	1.60	1.84
April	7,010	1,100	2,580	1.95	2.18
May	38,000	820	7,040	5.33	6.14
June	2,620	414	850	.644	.72
July	2,770	294	772	.585	.67
August	1,840	270	705	.534	.62
September	660	100	287	.217	.24
The year	38,000	100	1,590	1.20	16.32

COHOCTON RIVER NEAR SAVONA

Location.— Just below the highway bridge about 1¼ miles above the village of Savona and 4½ miles downstream from the village of Bath, Steuben County.

Drainage area.— 383 square miles (furnished by Mr. Robert O. Hayt).

Records available.— March 3, 1919, to September 30, 1919.

Gage.— Standard sloping and vertical staff. Slope gage supported on concrete pier located in left bank about 200 feet downstream from highway bridge. Vertical section spiked to downstream side of ash tree about 12 in. in diameter and 15 ft. back from edge of bank; read by Kenneth D. Ward.

Discharge measurements.— Made from standard cable equipment at medium and high stages; by wading just above the gage during low water.

Channel and control.— Firmly bedded gravel, not likely to shift.

Extremes of discharge.— Maximum stage recorded during period of record 9.18 feet at 6:30 A. M. May 23 (discharge, 6,900 second-feet); minimum stage recorded, 1.6 feet at 7 A. M. and 5 P. M. September 28, 29 and 30 (discharge, 33 second-feet).

Ice.— Stage-discharge relation probably affected by ice.

Regulation.— Seasonal distribution of flow is probably not affected by small reservoirs above.

Accuracy.— Stage-discharge relation fairly permanent. Probably affected by ice from December to March. Rating curve well defined up to a discharge of 6,000 second-feet.

Cooperation.— Station established and maintained by the United States Geological Survey in cooperation with the Lamoka Electric Power Corporation (Robert O. Hayt, Chief Engineer), and the State of New York.

Discharge measurements of Cohocton River near Savona, during the year ending September 30, 1919

DATE	Made by	Gage height	Dis-charge
		Feet	*Sec.-ft.*
Jan. 27	E. D. Burchard	2.39	185
Mar. 6	do	2.80	311
April 4	J. W. Moulton	3.32	528
13	M. H. Carson	5.02	1,710
14	do	4.40	1,170
15	do	4.01	957
20	do	3.22	523
May 22	O. W. Hartwell	8.40	5,740
25	do	6.59	3,300
July 26	C. C. Covert	2.05	87.5
Aug. 20	A. H. Davison	2.20	129
Sept. 11	do	1.75	46.7

Daily discharge, in second-feet, of Cohocton River near Savona, for the year ending September 30, 1919

DAY	Mar.	April	May	June	July	Aug.	Sept.
1	650	358	595	470	125	90	68
2	380	338	620	400	116	72	68
3	282	379	520	358	100	68	65
4	282	545	520	319	98	68	64
5	379	570	545	282	98	60	62
6	358	400	445	264	100	116	58
7	247	445	422	620	100	100	55
8	214	495	400	495	86	86	52
9	645	755	400	755	82	68	50
10	755	1,520	3,200	755	79	53	47
11	595	2,060	3 790	545	80	52	46
12	495	2,450	2,980	400	80	51	46
13	445	1,780	2,060	319	116	53	51
14	247	1,280	1,280	282	102	51	60
15	282	935	1,000	264	82	44	65
16	445	1,000	815	264	102	38	55
17	935	875	1,000	470	100	79	51
18	1,520	672	905	282	98	152	46
19	935	595	700	247	98	141	42
20	785	520	595	230	104	130	41
21	645	520	5,270	214	247	102	47
22	545	422	5,700	179	138	80	52
23	445	358	6,000	164	136	67	48
24	400	545	4,440	149	125	65	42
25	358	520	3,310	138	114	75	38
26	319	520	2,150	158	98	64	38
27	338	495	1,440	282	84	65	35
28	495	545	1,060	247	75	65	33
29	422	815	785	188	67	68	33
30	422	645	645	149	65	79	33
31	545	......	545	......	65	92	....

NOTE.— Daily discharge estimated March 1 and 2, by comparing with hydrograph of Cohocton Campbell.

Monthly discharge of Cohocton River near Savona, for the year ending September 30, 1919
[Drainage area, 383 square miles]

MONTH	DISCHARGE IN SECOND-FEET				RUN-OFF
	Maximum	Minimum	Mean	Per square mile	Depth in inches on drainage area
March	1,520	214	510	1.33	1.53
April	2,450	338	779	2.03	2.26
May	6,000	400	1,750	4.57	5.27
June	755	138	330	.862	.96
July	247	65	102	.266	.31
August	152	38	77.2	.203	.23
September	68	33	49.7	.130	.14

COHOCTON RIVER NEAR CAMPBELL

Location.—At the highway bridge, known locally as Red Bridge, nearly two miles upstream from the town of Campbell, Steuben County, and about midway between Campbell and Savona.

Drainage area.— 480 square miles (furnished by Mr. Robert O. Hayt).

Records available.— July 11, 1918, to September 30, 1919.

Gage.— Standard chain gage secured to the downstream handrail of the bridge near the left abutment; read by Miss Dora Wood.

Discharge measurements.— Made from bridge or by wading.

Channel and control.— Firmly bedded gravel, not likely to shift.

Extremes of discharge.— Maximum stage recorded during year, 7.75 feet at 7:30 A. M. May 23 (discharge, 9,280 second-feet); minimum stage recorded, 0.68 foot at 6 P. M. September 30 (discharge, 28 second-feet).

1918–1919: Maximum stage recorded 7.75 feet at 7:30 A. M. May 23, 1919 (discharge, 9,280 second-feet); minimum stage recorded, 0.68 foot at 6 P. M. September 30, 1919 (discharge, 28 second-feet).

Ice.— Stage-discharge relation probably affected by ice.

Regulation.— Seasonal distribution of flow is probably not affected by small reservoirs above.

Accuracy.— Stage-discharge relation practically permanent. Usually affected by ice from December to March. Rating curve well defined for discharges up to 6,500 second-feet.

Cooperation.— Station established and maintained by the United States Geological Survey in cooperation with Lamoka Electric Power Corporation. (Robert O. Hayt, Chief Engineer).

Discharge measurements of Cohocton River near Campbell, during the year ending September 30, 1919

DATE	Made by	Gage height	Discharge
		Feet	*Sec.-ft.*
Nov. 21	E. D. Burchard	1.94	611
21	do	1.92	602
Dec. 28	C. C. Covert	1.46	298
Jan. 27	E. D. Burchard	1.23	225
Mar. 6	do	1.54	375
April 4	J. W. Moulton	1.97	630
13	M. H. Carson	3.45	1,990
14	do	3.07	1,630
21	do	2.03	666
May 22	O. W. Hartwell	6.46	6,600
25	do	4.95	3,900
Aug. 22	A. H. Davison	1.07	147
22	do	1.02	113
Sept. 11	C. C. Covert	0.91	80.3

Daily discharge, in second-feet, of Cohocton River near Campbell, for the year ending September 30, 1918

DAY	July	Aug.	Sept.	DAY	July	Aug.	Sept.
1	......	117	104	16	106	80	73
2	......	92	68	17	104	80	138
3	......	92	68	18	99	73	178
4	......	120	66	19	102	75	307
5	......	92	66	20	96	71	688
6	......	93	94	21	84	73	549
7	......	112	117	22	78	68	376
8	......	99	84	23	84	82	288
9	......	92	63	24	96	71	262
10	......	102	62	25	228	66	241
11	129	90	75	26	158	71	331
12	154	96	66	27	109	68	312
13	135	80	94	28	117	66	262
14	112	82	109	29	99	66	224
15	93	89	80	30	141	73	189
				31	138	73	......

Daily discharge, in second-feet, of Cohocton River near Campbell, for the year ending Sept. 30, 1919

DAY	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1	193	430	193	298	182	725	457	725	581	180	184	100
2	186	430	270	616	402	457	457	725	517	162	153	110
3	186	350	197	457	293	350	457	616	457	175	103	86
4	193	336	197	340	201	350	688	616	402	141	83	100
5	164	336	212	320	208	402	688	650	402	117	100	97
6	171	288	161	320	197	402	650	517	350	175	250	110
7	208	257	249	400	232	307	650	549	725	121	175	68
8	201	241	216	500	236	298	650	517	581	141	117	56
9	201	249	549	400	208	762	915	517	688	125	114	56
10	182	224	430	480	147	955	1,700	2,900	955	103	90	65
11	158	220	430	460	182	688	1,500	4,220	725	166	86	59
12	164	224	340	440	430	487	2,900	3,610	616	141	97	97
13	168	216	321	420	224	581	2,030	2,610	517	149	83	97
14	147	186	725	380	280	307	1,600	1,810	402	137	90	71
15	151	189	955	360	350	457	1,310	1,310	350	121	65	83
16	144	171	725	340	253	517	1,310	1,040	376	153	71	80
17	135	182	616	320	280	1,130	1,130	1,600	457	141	250	90
18	138	1,400	487	300	186	1,810	1,220	1,220	376	121	260	90
19	138	1,040	402	345	175	1,130	762	955	305	114	345	77
20	135	762	350	402	257	955	650	725	300	114	245	59
21	151	620	326	350	193	800	650	5,720	295	153	180	59
22	147	549	350	280	164	800	517	6,470	245	305	137	71
23	147	430	457	326	193	725	457	7,060	221	166	110	53
24	117	376	402	457	182	581	650	5,030	193	184	103	103
25	120	316	487	402	164	430	650	4,060	180	153	86	56
26	178	293	430	307	197	402	581	2,770	245	137	86	49
27	189	270	280	298	171	402	838	1,920	402	125	121	44
28	158	236	331	241	457	616	725	1,310	350	117	86	40
29	154	253	331	224	....	581	875	998	240	103	121	35
30	171	266	293	212	....	549	725	838	198	90	103	30
31	762	....	326	171	....	650	...	688	...	110	153	...

NOTE.—Stage-discharge relation probably affected by ice January 5 to 18, inclusive.

Monthly discharge of Cohocton River near Campbell, for the year ending September 30, 1918
[Drainage area, 480 square miles]

MONTH	DISCHARGE IN SECOND-FEET				RUN-OFF
	Maximum	Minimum	Mean	Per square mile	Depth in inches on drainage area
July	228	78	....	....	....
August	120	66	84.4	.176	.20
September	688	62	188	.392	.44

Monthly discharge of Cohocton River near Campbell, for the year ending September 30, 1919
[Drainage area, 480 square miles]

MONTH	DISCHARGE IN SECOND-FEET				RUN-OFF
	Maximum	Minimum	Mean	Per square mile	Depth in inches on drainage area
October	762	117	182	.379	.44
November	1,400	171	378	.788	.88
December	955	161	388	.808	.93
January	616	171	360	.750	.86
February	457	147	237	.494	.51
March	1,810	298	632	1.32	1.52
April	2,900	457	946	1.97	2.20
May	7,060	517	2,070	4.31	4.97
June	955	180	421	.877	.98
July	305	90	143	.298	.34
August	345	65	137	.285	.33
September	110	30	73	.152	.17
The year	7,060	30	500	1.04	14.12

MUD CREEK AT SAVONA

Location.— On the farm of L. R. Travis in the town of Savona, Steuben County; about half mile above the mouth.

Drainage area.— 80 square miles (furnished by Mr. Robert O. Hayt).

Records available.— July 8, 1918, to September 30, 1919.

Gage.— Vertical staff secured to 8-inch by 8-inch timber planted in concrete at the water's edge on the left bank 150 feet upstream from farm bridge. Read by L. R. Travis.

Discharge measurements.— Made by wading at the gage or from farm bridge.

Channel and control.— Fairly well compacted gravel and not likely to shift. Considerable grass growth in stream bed. Control probably submerged by backwater from the Cohocton River during extreme floods.

Extremes of discharge.— Maximum stage recorded during year 6.65 feet at 6:45 A. M. May 23 (discharge, 852 second-feet); minimum stage recorded, 3.25 feet at 8 P. M. September 30 (discharge, 4 second-feet).

1918–1919: Maximum stage recorded, 6.65 feet at 6:45 A. M. May 23, 1919 (discharge, 852 second-feet); minimum stage recorded, 3.25 feet at 8 P. M. September 30, 1919 (discharge, 4 second-feet).

Ice.— Stage-discharge relation affected by ice.

Regulation.— Grist mills at Bradford, seven miles upstream cause some diurnal fluctuation in flow.

Accuracy.— Stage-discharge relation poorly defined; affected by ice from December to March and by aquatic plant growth from June to November.

Cooperation.— Station established by the Lamoka Electric Power Company under the direction of the United States Geological Survey. Maintained by the survey in cooperation with the Power Co. and the State of New York.

Discharge measurements of Mud Creek at Savona, during the year ending September 30, 1919

DATE	Made by	Gage height	Discharge
		Feet	*Sec.-ft.*
Nov. 21	E. D. Burchard	3.69	38.4
21	do	3.69	39.6
Jan. 27	do	3.59	30.5
April 4	J. W. Moulton	3.98	70.8
13	M. H. Carson	4.88	212
14	do	4.75	187
15	do	4.65	170
20	do	4.02	72.3
May 22	O. W. Hartwell	5.76	401
25	do	6.40	746
26	do	5.90	548
July 25*a*	C. C. Covert	3.44	12.9
Sept. 11	A. H. Davison	3.44	13.5
11	do	3.44	13.7

a Considerable aquatic growth on control.

Daily discharge, in second-feet, of Mud Creek at Savona, for the year ending September 30, 1918

DAY	July	Aug.	Sept.	DAY	July	Aug.	Sept.
1	......	18	20	16	19	22	8
2	......	17	12	17	19	24	14
3	......	15	13	18	19	15	20
4	......	20	16	19	17	14	12
5	......	18	14	20	22	15	90
6	......	20	13	21	20	16	65
7	......	20	14	22	16	16	30
8	20	17	15	23	17	26	18
9	20	18	12	24	32	14	19
10	26	24	13	25	65	12	19
11	24	17	12	26	36	13	36
12	30	15	12	27	24	22	28
13	24	15	20	28	18	14	20
14	24	24	13	29	17	15	20
15	19	15	15	30	24	15	14
				31	24	14	....

Daily discharge, in second-feet, of Mud Creek at Savona, for the year ending September 30, 1919

DAY	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept,
1	20	34	25	36	29	46	57	73	63	25	21	15
2	16	30	26	57	33	28	62	66	66	25	25	16
3	15	26	33	48	29	28	54	63	66	24	18	23
4	20	20	29	48	27	29	66	63	60	24	12	16
5	14	24	26	40	26	37	73	71	63	22	13	28
6	14	22	24	31	26	36	63	63	57	26	47	15
7	17	20	36	29	28	36	61	59	136	22	21	15
8	15	20	29	33	23	27	63	61	86	25	24	11
9	13	20	38	36	25	80	73	80	86	31	22	25
10	12	22	29	29	25	120	120	300	106	19	19	17
11	16	22	27	32	25	66	240	435	144	22	15	14
12	22	24	36	25	26	54	270	510	120	20	18	14
13	20	20	35	29	22	54	216	510	86	17	14	21
14	11	20	51	35	29	39	188	365	66	15	14	15
15	12	20	67	41	33	35	170	161	56	17	13	11
16	14	17	58	31	26	71	170	106	67	19	12	12
17	11	22	44	33	29	128	170	128	73	17	50	11
18	13	106	36	36	26	136	144	120	53	14	31	9
19	12	73	32	35	22	86	128	92	41	14	34	11
20	14	50	29	33	28	80	73	67	42	15	29	11
21	11	41	33	33	25	80	86	220	35	18	21	15
22	18	36	37	33	25	179	80	360	35	29	18	11
23	12	36	46	37	26	161	68	700	32	17	15	12
24	13	31	42	46	25	106	80	705	29	15	18	21
25	13	29	40	40	26	57	71	745	29	14	13	11
26	17	31	42	33	25	45	73	550	38	13	19	7
27	17	31	33	35	29	56	68	270	44	14	22	10
28	12	25	33	31	32	86	73	144	36	12	17	10
29	19	29	36	31	......	71	73	99	33	21	20	5
30	20	32	33	31	......	68	68	73	28	14	18	4
31	65	......	35	25	......	73	......	68	......	13	21	......

NOTE. — Stage-discharge relation affected by growth on control October 1 to November 14, and from June 30 to September 30; also by backwater from Cohocton River, May 21 to 23. Daily discharge for these periods is approximate.

Monthly discharge of Mud Creek at Savona, for the year ending September 30, 1918

[Drainage area, 80 square miles]

MONTH	DISCHARGE IN SECOND-FEET				RUN-OFF
	Maximum	Minimum	Mean	Per square mile	Depth in inches on drainage area
August	26	12	17.4	0.218	.25
September	90	8	20.9	.216	.29

Monthly discharge of Mud Creek at Savona, for the year ending September 30, 1919

[Drainage area, 80 square miles]

MONTH	DISCHARGE IN SECOND-FEET				RUN-OFF
	Maximum	Minimum	Mean	Per square mile	Depth in inches on drainage area
October	65	11	16.7	.209	.24
November	106	17	31.1	.388	.43
December	67	24	36.1	.451	.52
January	57	25	35.2	.440	.51
February	33	22	26.8	.335	.35
March	179	27	70.9	.886	1.02
April	270	54	107	1.34	1.50
May	745	59	236	2.95	3.40
June	144	28	62.5	.781	.87
July	31	12	19.1	.239	.28
August	50	12	21.1	.264	.30
September	28	4	13.9	.174	.19
The year	745	4	56.7	.709	9.61

ALLEGHENY RIVER AT RED HOUSE

Location.—At highway bridge in Red House, Cattaraugus County, about 5 miles below Salamanca and 13 miles above the boundary between New York and Pennsylvania. Conewango Creek, the outlet of Chautauqua Lake, enters the Allegheny in Pennsylvania about 30 miles below the station.

Drainage area.— 1,640 square miles.

Records available.— September 4, 1903, to September 30, 1919.

Gage.— Gurley 7-day graph water-stage recorder on the left bank just below the highway bridge, installed September 3, 1917. Prior to this date, chain gage attached to the upstream side of bridge near left end. Recorder inspected by W. E. Coe.

Discharge measurements.— Made from downstream side of bridge.

Channel and control.— Coarse gravel, occasionally shifting. Current good for medium and high stages, slow at low stages.

Extremes of discharge.— Maximum stage recorded during year, 10.12 feet at noon May 23 (discharge, 21,400 second-feet); minimum stage recorded, 3.18 feet at 2 P. M. July 21 (discharge, 312 second-feet).

1903–1919: Maximum stage recorded, 12.7 feet March 26, 1913 (discharge, 40,000 second-feet); minimum stage recorded, 2.7 feet several days in December, 1908 (discharge about 100 second-feet).

Ice.— Stage-discharge relation somewhat affected by ice.

Regulation.— Low water flow may be slightly affected by the operation of several small power plants above Salamanca. A storage reservoir on the divide between Oil Creek, tributary to Allegheny River, and Genesee River, tributary to Lake Ontario, was formerly used for supplying water to the Erie Canal system through the abandoned Genesee River Canal and the Genesee River. This reservoir is no longer used for canal purposes. Water is all turned into Allegheny River through Olean Creek.

Accuracy.— Stage-discharge relation practically permanent between dates of shifting. Usually affected by ice during most of the period from December to February. Rating curve well defined between 300 and 900 second-feet and between 6,000 and 15,000 second-feet. Operation of water-stage recorder satisfactory. Daily gage height determined by inspection of hydrograph record. Daily discharge ascertained by applying mean daily gage heights to rating table. Results good except for periods when the stage-discharge relation was affected by ice, when results were fair.

Discharge measurements of Allegheny River at Red House, during the year ending September 30, 1919

DATE	Made by	Gage height	Discharge
		Feet	*Sec.-ft.*
April 18........	M. H. Carson..	6.01	5,570
May 17........	J. W. Moulton..	6.46	6,820
June 18........	do	3.77	905

Daily discharge, in second-feet, of Allegheny River at Red House, for the year ending September 30, 1919

DAY	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1	1,460	8,070	1,770	3,750	1,370	3,230	1,870	2,680	2,480	848	528	1,720
2	1,380	6,690	1,560	7,910	1,030	3,660	1,790	2,980	2,090	727	645	1,380
3	1,500	5,560	1,580	6,690	1,070	2,600	1,720	2,980	1,770	635	566	1,660
4	1,690	5,420	1,610	5,030	1,310	2,310	1,720	2,880	1,560	576	454	1,580
5	1,610	5,970	1,520	3,900	1,180	2,440	1,910	3,200	1,400	500	400	1,360
6	1,540	4,640	1,460	3,200	980	2,880	1,940	2,980	1,360	481	1,180	1,160
7	2,640	3,780	1,420	2,980	882	2,800	1,820	2,980	1,360	490	2,020	980
8	3,090	3,200	2,390	3,090	905	2,620	2,220	3,420	1,320	509	1,270	836
9	2,620	2,880	5,030	2,880	790	4,030	4,520	3,420	1,310	454	980	748
10	2,310	2,700	3,780	2,040	859	6,400	7,030	10,400	1,460	427	769	665
11	2,020	2,520	3,090	1,940	870	5,290	11,000	18,800	1,250	645	645	605
12	1,860	2,160	3,200	1,690	824	4,270	14,100	15,400	1,020	738	556	605
13	1,970	1,960	3,090	1,610	1,070	3,900	10,600	11,400	870	528	509	685
14	1,870	1,840	4,400	1,740	1,920	3,090	8,900	8,560	802	427	481	635
15	1,770	1,690	6,840	1,970	1,940	2,680	6,990	8,070	824	427	436	538
16	1,610	1,550	5,970	1,870	1,940	2,860	6,260	5,160	1,020	576	400	490
17	1,440	1,890	4,900	1,660	1,720	5,290	5,830	5,970	918	509	436	454
18	1,310	3,200	4,020	1,560	1,310	7,140	5,290	7,140	980	418	3,110	427
19	1,300	5,030	3,420	1,550	1,190	6,690	4,640	5,700	780	362	4,140	400
20	1,300	5,160	2,880	1,370	930	5,290	4,020	5,650	696	332	3,660	392
21	1,500	4,900	2,580	1,360	859	4,520	3,900	13,200	1,910	325	2,600	445
22	1,500	4,400	2,240	1,320	900	3,900	3,420	18,800	1,580	1,780	1,940	556
23	1,400	3,780	1,740	1,480	950	3,310	2,880	20,800	1,030	2,780	1,560	743
24	1,400	3,200	1,550	2,640	1,000	2,860	3,420	19,800	790	1,600	1,270	727
25	1,300	2,800	1,870	2,700	1,100	2,520	3,540	16,800	675	1,080	1,140	605
26	2,000	2,460	1,550	2,350	1,000	2,270	3,200	12,500	790	848	1,210	518
27	2,740	2,150	2,680	2,150	1,100	2,110	3,310	9,250	1,440	696	1,030	463
28	2,460	1,960	3,310	1,940	1,430	2,330	3,310	6,840	1,770	665	955	445
29	3,200	2,020	2,980	1,840	......	2,380	3,420	4,900	1,380	645	870	400
30	3,660	2,040	2,980	1,710	......	2,160	2,980	3,780	1,030	605	813	378
31	8,040	......	2,460	1,490	......	2,020	......	2,880	......	518	1,220	......

NOTE. — Daily discharge estimated because of no gage height record October 19 to 26, and February 22 to 27, by comparing gage height record with that of Cattaraugus, Versailles.

Monthly discharge of Allegheny River at Red House, for the year ending September 30, 1919
[Drainage area, 1 640 square miles]

MONTH	DISCHARGE IN SECOND-FEET				RUN-OFF
	Maximum	Minimum	Mean	Per square mile	Depth in inches on drainage area
October	8,040	1,300	2,110	1.29	1.49
November	8,070	1,550	3,520	2.15	2.40
December	6,840	1,420	2,900	1.77	2.04
January	7,910	1,320	2,560	1.56	1.80
February	1,940	790	1,160	.708	.74
March	7,140	2,020	3,540	2.16	2.49
April	14,100	1,720	4,580	2.79	3.11
May	20,800	2,680	8,360	5.10	5.88
June	2,480	675	1,260	.768	.86
July	2,780	325	715	.436	.50
August	4,140	400	1,220	.744	.86
September	1,720	378	753	.459	.51
The year	20,800	325	2,740	1.67	22.68

CATTARAUGUS CREEK AT VERSAILLES

Location.—At the three-span highway bridge in Versailles, Cattaraugus County, 2¼ miles above mouth of Clear Creek, about 6 miles below Gowanda, and about 8 miles above mouth of stream.

Drainage area.— 467 square miles (measured on post-route map).

Records available.— September 23, 1910, to September 30, 1919.

Gage.— Chain on upstream side of right span of bridge; read by Charles Wilson.

Discharge measurements.— Made from downstream side of bridge or by wading.

Channel and control.— Bed composed of rock and gravel; shifting.

Extremes of discharge.— Maximum stage recorded during year 9.5 feet at 7.15 P. M. May 10 (discharge, 14,200 second-feet); minimum stage recorded, 4.65 feet at 7 A. M. September 27 (discharge, 66 second-feet).

1910–1919: Maximum open-water stage recorded, 11.6 feet at 5.40 P. M. March 25, 1918 (discharge, about 30,000 second-feet); minimum stage recorded, 4.35 feet several times in August, 1918 (discharge about 49 second-feet).

Ice.— Stage-discharge relation affected by ice.

Accuracy.— Stage-discharge relation not permanent; usually affected by ice during much of the period December to March, inclusive. Gage read to half-tenths twice daily. Daily discharge throughout year ascertained by indirect method, applying mean daily effective gage height to rating table; corrections for obtaining effective gage heights determined from discharge measurements. Records fair.

Discharge measurements of Cattaraugus Creek at Versailles, during the year ending September 30, 1919

DATE	Made by	Gage height	Discharge
		Feet	*Sec.-ft.*
April 2	J. W. Moulton	5.05	365
17	M. H. Carson	5.90	1,580
May 17	J. W. Moulton	6.24	2,460
June 18	do	4.94	208
July 25	C. C. Covert	4.82	125

Daily discharge, in second-feet, of Cattaraugus Creek at Versailles, for the year ending Sept. 30, 1919

DAY	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1	240	1,200	380	2,400	320	3,200	500	900	400	180	140	140
2	200	1,600	320	2,400	240	900	360	950	340	180	120	100
3	650	1,200	380	850	320	700	360	800	340	180	100	100
4	340	1,300	460	500	380	700	460	750	320	170	100	100
5	280	1,400	400	400	380	900	500	1,200	400	150	120	95
6	480	750	440	380	280	750	460	900	320	150	140	100
7	850	600	320	400	380	550	600	800	340	160	140	85
8	460	550	1,500	460	380	500	550	750	380	140	110	90
9	340	400	2,000	400	320	2,400	1,000	850	320	140	110	95
10	280	440	950	300	320	1,500	2,000	5,000	280	170	100	80
11	240	380	700	260	320	1,100	4,400	7,000	280	140	80	100
12	240	320	750	200	380	750	3,000	2,600	240	140	100	120
13	320	320	650	200	380	1,000	1,800	1,700	240	140	100	150
14	260	300	1,400	950	700	500	1,300	1,300	240	130	100	110
15	260	260	2,400	1,200	1,300	500	1,000	1,000	240	120	90	100
16	240	260	1,000	1,000	600	950	1,900	900	220	140	85	100
17	220	300	750	1,100	460	2,000	1,500	2,600	200	150	140	110
18	190	380	550	900	400	2,200	1,200	1,500	200	110	1,500	95
19	180	650	460	500	320	1,200	1,000	1,000	220	100	320	100
20	200	650	380	480	300	800	800	1,000	240	110	240	80
21	950	550	380	500	400	700	1,000	3,400	220	130	180	85
22	460	600	500	800	380	600	750	6,000	200	170	150	100
23	500	480	900	1,000	1,200	500	650	2,400	180	140	140	100
24	280	380	600	1,600	650	500	1,800	1,400	180	120	120	100
25	240	320	1,100	800	700	460	950	1,200	190	110	110	100
26	300	300	750	700	700	400	900	800	420	140	100	100
27	340	280	550	550	440	460	1,500	700	600	100	120	75
28	320	320	480	460	460	600	1,700	550	320	100	140	90
29	500	750	440	440	......	440	1,700	500	220	95	110	75
30	550	700	460	380	......	440	1,000	480	200	100	140	80
31	2,600	.....	500	340	......	440	......	440	......	120	120	.....

Monthly discharge of Cattaraugus Creek at Versailles, for the year ending September 30, 1919
[Drainage area, 467 square miles]

MONTH	Discharge in Second-feet				Run-off
	Maximum	Minimum	Mean	Per square mile	Depth in inches on drainage area
October	2,600	180	436	.934	1.08
November	1,600	260	598	1.28	1.43
December	2,400	320	737	1.58	1.82
January	2,400	200	737	1.58	1.82
February	1,300	240	479	1.03	1.07
March	3,200	400	924	1.98	2.28
April	4,400	360	1,220	2.61	2.91
May	7,000	440	1,660	3.55	4.09
June	600	180	283	.606	.70
July	180	95	136	.291	.33
August	1,500	80	173	.371	.43
September	150	75	98.5	.211	.24
The year	7,000	75	625	1.34	18.20

LITTLE TONAWANDA CREEK AT LINDEN

Location.—At stone-arch highway bridge in Linden, Genesee County, 3 miles above junction with Tonawanda Creek.

Drainage area.— 22 square miles (measured on topographic maps).

Records available.— July 8, 1912, to September 30, 1919.

Gage.— Vertical staff on upstream side of right abutment; lower 2 feet of enameled iron, graduated to hundredths of a foot; upper 4 feet of bronze graduated to half-tenths; read by Thomas W. Mills and C. L. Schenck.

Discharge measurements.— Made from cable 1,000 feet above gage or by wading near gage.

Channel and control.— The weir formerly in use was entirely destroyed by ice February 20, 1918, and has not been replaced. The section of the channel which forms the control since the destruction of the weir is of coarse gravel and boulders and is probably permanent between dates of shift.

Extremes of discharge.— Maximum stage recorded during year, 9.0 feet at 6 P. M. May 10 (discharge, 2,500 second-feet); minimum stage recorded minus .41 foot several times in August and September (discharge, 1.5 second-feet).

1912–1919: Maximum stage recorded 9.0 feet at 6 P. M. May 10, 1919 (discharge 2,500 second-feet); minimum stage recorded, 0.18 foot August 20 and 21, September 14–16, and October 8, 1913 (discharge, 0.43 second-foot).

Accuracy.— Stage-discharge relation permanent between dates of shift. Rating curve fairly well defined. Gage read to hundredths twice daily. Daily discharge ascertained by applying mean daily gage height to rating table. Results fairly good.

Cooperation.— Station established and maintained by the United States Geological Survey in cooperation with the State Conservation Commission and State Engineer.

Discharge measurements of Little Tonawanda Creek at Linden, during the year ending Sept. 30, 1919

DATE	Made by	Gage height	Discharge
		Feet	*Sec.-ft.*
Jan. 23	E. D. Burchard	0.22	36.8
May 16	J. W. Moulton	0.13	35.6
June 17	do	0.015	25.0
17	do	0.005	25.7
July 24	C. C. Covert	—0.36	2.44
24	do	—0.36	1.97

Daily discharge, in second-feet, of Little Tonawanda Creek at Linden, for the year ending Sept. 30, 1919

DAY	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1	2.4	18	14	59	11	158	17	35	10	5.9	2.4	2.4
2	2.7	14	11	46	9.2	46	17	28	9.6	5.1	2.1	2.1
3	3.2	11	9.6	21	9.2	25	14	22	8.2	4.7	1.9	2.1
4	3.8	16	11	35	10	32	14	24	7.8	4.3	1.9	1.9
5	3.5	18	10	30	12	51	14	73	11	3.8	1.6	1.9
6	11	13	22	28	10	39	18	32	18	3.8	1.9	1.9
7	14	9.6	17	29	8	28	32	23	17	4.0	1.6	1.6
8	7.4	8.2	91	28	6	22	19	20	180	3.8	1.6	1.6
9	5.9	8.2	68	18	5	165	49	26	60	3.2	1.5	1.6
10	5.5	8.7	26	14	5	76	82	940	23	3.5	1.5	1.6
11	4.7	7.4	19	12	5	55	165	380	14	3.2	1.5	2.1
12	4.7	7.0	21	12	7	49	74	165	12	3.0	1.6	3.2
13	5.9	6.6	22	14	20	35	51	75	9.2	3.0	1.6	2.1
14	6.2	5.9	66	26	54	27	42	44	8.2	2.7	1.6	2.1
15	5.9	5.9	60	22	33	17	26	32	8.2	3.8	1.5	2.1
16	5.1	5.5	28	19	21	77	136	30	123	3.2	1.6	2.1
17	4.3	5.9	19	18	14	188	46	64	20	3.0	9.2	1.9
18	4.3	10	13	18	19	136	34	39	11	2.7	8.7	1.9
19	3.8	13	11	16	13	46	25	25	8.2	2.7	5.9	1.9
20	5.9	11	12	15	11	30	22	320	9.2	2.4	3.8	3.0
21	21	12	12	15	10	28	23	340	8.2	4.3	3.0	2.1
22	11	10	20	17	10	21	19	940	7.0	5.9	2.7	2.1
23	8.2	8.7	21	35	22	18	16	116	5.9	3.2	2.4	2.1
24	7.4	7.4	18	43	16	18	73	62	5.9	2.7	2.4	2.4
25	7.0	7.0	86	39	18	14	40	43	5.5	2.7	2.4	2.4
26	7.4	5.9	28	17	26	12	44	30	105	3.5	2.7	1.9
27	8.2	5.1	18	13	24	17	130	24	25	2.7	2.4	2.1
28	8.2	5.9	13	12	26	18	100	19	12	2.4	2.1	1.9
29	12	16	12	11	......	15	80	16	8.7	2.4	2.4	1.6
30	11	13	10	11	......	14	40	13	7.4	2.1	3.2	1.6
31	29	......	11	20	......	16	......	11	......	2.1	2.7	......

Note.— Discharge estimated January 9 to 21, February 6 to 13, 19, 20, 27, by comparing gage height record with that of Allegheny, Red House, and Cattaraugus, Versailles.

Monthly discharge of Little Tonawanda Creek at Linden, for the year ending September 30, 1919
[Drainage area, 22.0 square miles]

MONTH	Discharge in Second-feet				Run-off
	Maximum	Minimum	Mean	Per square mile	Depth in inches on drainage area
October	29	2.4	7.76	.353	.41
November	18	5.1	9.80	.446	.50
December	91	9.6	25.8	1.17	1.35
January	59	11	23.0	1.04	1.20
February	54	5	15.5	.705	.73
March	188	12	47.9	2.18	2.51
April	165	14	48.7	2.21	2.47
May	940	11	129	5.86	6.76
June	180	5.5	25.3	1.15	1.28
July	5.9	2.1	3.4	.155	.18
August	9.2	1.5	2.7	.123	.14
September	3.2	1.6	2.0	.091	.10
The year	940	1.5	28.6	1.30	17.63

Genesee River at Scio

Location.—At steel highway bridge one-fourth mile above Vandermark Creek, half a mile above Scio, Allegany County, and 1 mile above Knight Creek.

Drainage area.— 288 square miles (measured on map issued by United States Geological Survey, scale, 1:500,000).

Records available.— June 12, 1916, to September 30, 1919.

Gage.— Vertical staff attached to downstream face of left bridge abutment; read by Miss Retta B. Potter and Mrs. Margaret Potter.

Discharge measurements.— Made from downstream side of bridge or by wading.

Channel and control.— Coarse gravel; probably permanent.

Extremes of discharge.— Maximum stage recorded during year 9.1 feet at noon May 22 (discharge, 10,600 second-feet); minimum stage recorded, 0.50 foot at 9 A. M. July 20 (discharge, 25 second-feet).

1916–1919: Maximum stage recorded, 9.1 feet at noon May 22, 1919 (discharge, 10,600 second-feet); minimum stage recorded, 0.50 foot at 9 A. M. July 20, 1919 (discharge, 25 second-feet).

Ice.— Stage-discharge relation affected by ice.

Accuracy.— Stage-discharge relation practically permanent; usually affected by ice during much of period December to March. Rating curve well defined between 25 and 5,500 second-feet. Gage read to hundredths twice daily. Daily discharge ascertained by applying mean daily gage height to rating table. Open-water records good; winter records fair.

Discharge measurements of Genesee River at Scio, during the year ending September 30, 1919

DATE	Made by	Gage height	Discharge
		Feet	*Sec.-ft.*
Jan. 23	E. D. Burchard	1.24	234
April 3	J. W. Moulton	1.48	308
19	M. H. Carson	2.15	677
May 19	J. W. Moulton	2.19	709
June 19	do	0.89	126

Daily discharge, in second-feet, of Genesee River at Scio, for the year ending September 30, 1919

DAY	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1	238	258	218	300	164	1,150	345	336	390	99	178	211
2	218	322	218	920	200	304	332	336	318	84	99	167
3	258	345	218	518	242	258	336	287	266	66	82	262
4	218	390	218	440	154	250	440	345	234	61	69	211
5	218	415	218	415	174	345	545	345	211	57	64	164
6	440	345	218	390	122	390	465	309	181	87	336	138
7	390	336	218	465	164	345	440	345	690	79	234	116
8	322	318	258	390	128	314	1,150	368	390	55	200	87
9	258	309	218	368	440	690	1,400	440	885	41	135	82
10	218	345	218	300	254	660	1,780	2,540	390	74	116	77
11	218	258	218	440	164	518	2,660	2,210	300	74	96	87
12	218	258	218	283	164	415	2,320	2,100	234	49	87	84
13	258	258	218	345	157	415	1,490	1,310	188	41	107	82
14	218	275	258	266	234	283	1,150	990	147	39	87	77
15	258	258	258	309	292	296	920	850	104	49	64	66
16	258	258	300	318	171	292	1,150	815	87	51	61	61
17	218	345	390	218	144	750	920	1,310	180	41	1,990	57
18	218	720	440	314	171	1,310	780	920	180	38	1,490	51
19	181	3,310	390	214	238	720	660	690	120	31	780	45
20	181	2,540	390	250	226	600	600	750	309	27	490	55
21	218	720	390	327	128	572	660	4,390	238	51	368	43
22	181	600	415	181	110	518	490	8,090	138	1,310	322	71
23	147	545	490	242	116	390	465	5,300	110	345	266	55
24	141	440	545	440	113	390	490	4,110	87	211	200	59
25	147	390	490	283	122	340	490	2,780	79	300	175	57
26	196	345	440	271	171	318	440	1,680	188	119	250	51
27	188	345	390	250	104	345	415	1,230	440	258	196	45
28	181	300	345	218	147	518	390	815	254	122	178	39
29	181	258	300	218	......	480	390	690	164	110	161	35
30	279	218	300	211	......	500	332	572	128	84	234	31
31	300	......	300	164	......	465	......	465	......	90	279	......

NOTE.— Discharge estimated June 17 to 19, by comparing with hydrograph of Genesee, St. Helena, and Genesee, Jones Bridge. Stage-discharge relation not affected by ice.

Monthly discharge of Genesee River, at Scio, for the year ending September 30, 1919
[Drainage area, 288 square miles]

MONTH	DISCHARGE IN SECOND-FEET				RUN-OFF
	Maximum	Minimum	Mean	Per square mile	Depth in inches on drainage area
October	440	141	231	.802	.92
November	3,310	218	534	1.85	2.06
December	545	218	313	1.09	1.26
January	920	164	334	1.16	1.34
February	440	104	179	.622	.58
March	1,310	250	488	1.69	1.95
April	2,660	332	815	2.83	3.16
May	8,090	287	1,540	5.35	6.17
June	885	79	254	.882	.98
July	1,310	27	134	.465	.54
August	1,990	61	303	1.05	1.21
September	262	31	88.9	.309	.34
The year	8,090	27	437	1.52	20.51

GENESEE RIVER AT ST. HELENA

Location.—At steel highway bridge in St. Helena, Wyoming County, 5½ miles below Portageville and site of proposed storage dam of New York Conservation Commission and 9½ miles above mouth of Canaseraga Creek.

Drainage area.— 992 square miles.

Records available.—August 14, 1908, to September 30, 1919.

Gage.— Stevens continuous water-stage recorder on left bank just below bridge, installed September 28, 1917, and a chain gage on upstream side of the bridge, installed August 14, 1908. Automatic gage installed primarily to define fluctuations in medium and high stages; at gage height 3.3 feet an auxiliary inlet becomes operative. Below this stage, chain gage heights are used. Water-stage recorder inspected by C. S. DeGolyer. Chain gage read by Herman Piper.

Discharge measurements.— Made from bridge or by wading.

Channel and control.— Gravel and rocks; shifting occasionally.

Extremes of discharge.—Maximum stage during year, from water-stage recorder, 11.35 feet at 4.30 P. M. May 22 (discharge, 32,800 second-feet; minimum stage from chain gage 2.30 feet at 7 A. M. September 30 (discharge, 60 second-feet).

1908–1919: Maximum stage, from water-stage recorder, 12.81 feet at 8 A. M. May 17, 1916 (discharge, 43,500 second-feet); minimum stage recorded, 1.70 feet at 5 P. M. October 5 and 8 A. M. October 17, 1913 (discharge, about 18 second-feet).

Ice.— Stage-discharge relation somewhat affected by ice.

Accuracy.— Stage-discharge relation not permanent. Rating curve used for chain gage well defined between 50 and 2,000 second-feet. Curve used for automatic gage fairly well defined between 400 and 30,000 second-feet. Gage heights above 3.3 feet taken from recorder; below 3.3 feet, from chain gage. Daily discharge ascertained by applying mean daily gage height to proper rating table except for days of great range in stage, when it was determined by averaging hourly discharge. Records fair.

Discharge measurements of Genesee River at St. Helena, during the year ending September 30, 191

DATE	Made by	Gage height	Discharge
		Feet	*Sec.-ft.*
Nov. 23	C. S. DeGolyer	3.84	1,280
Dec. 26	do	4.27	1,780
Jan. 11	do	3.10	574
April 11	do	6.57	5,920
May 12	do	6.46	5,980
15	J. W. Moulton	4.66	2,070
22	C. S. DeGolyer	11.19	32,200
June 16	J. W. Moulton	3.05	470
July 23	C. C. Covert	3.70	1,030
Sept. 10	A. H. Davison	2.71	219
10	do	2.69	202

Daily discharge, in second-feet, of Genesee River at St. Helena, for the year ending September 30, 1919.

DAY	Oct.	Nov.	Dec.	Jan	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1	348	2,470	748	985	336	2,300	860	1,300	1,200	203	193	465
2	450	1,840	470	5,360	348	1,370	772	1,300	1,050	157	274	367
3	470	1,500	540	2,140	342	906	730	1,200	906	215	203	312
4	540	1,310	662	1,090	436	772	860	1,100	835	119	157	381
5	403	1,560	580	885	410	1,000	1,250	1,540	748	119	172	312
6	423	1,560	620	748	354	1,360	1,250	1,360	705	183	238	299
7	705	1,140	540	790	342	1,050	1,150	1,100	1,200	132	620	249
8	620	885	662	985	354	953	1,200	1,200	1,200	157	381	193
9	470	790	3,650	790	342	2,140	2,600	1,200	1,800	193	312	215
10	403	748	1,700	540	366	3,320	4,750	10,400	1,540	119	215	193
11	348	790	1,200	505	203	2,290	9,000	15,000	1,000	119	261	215
12	342	705	1,090	838	354	1,600	9,800	6,350	748	162	209	339
13	331	620	1,200	885	342	1,660	3,700	4,620	662	162	162	261
14	403	540	2,140	790	372	906	3,320	3,110	465	144	249	193
15	331	443	3,650	790	1,140	816	2,440	2,290	465	144	119	226
16	366	470	2,650	885	662	1,300	2,950	2,000	430	274	136	255
17	320	416	1,560	748	416	3,510	2,950	3,100	465	238	395	162
18	257	1,500	1,200	705	354	4,970	2,290	3,500	395	162	2,290	152
19	277	3,220	935	705	292	2,440	1,930	2,140	312	193	1,480	136
20	211	1,990	838	540	309	1,860	1,540	2,390	261	111	1,050	162
21	257	1,630	790	580	391	1,540	1,600	11,100	953	238	772	119
22	360	1,370	885	620	366	1,360	1,420	23,800	540	359	620	172
23	309	1,200	1,920	790	379	1,100	1,150	15,600	339	1,300	540	183
24	277	985	1,990	1,770	410	906	1,660	8,980	238	540	465	193
25	277	838	2,060	1,310	457	816	1,800	8,340	238	339	395	193
26	257	620	1,840	985	457	772	1,540	4,730	367	274	620	152
27	540	662	1,090	838	430	730	1,860	3,410	860	238	381	127
28	540	457	885	705	348	953	2,000	2,440	816	339	299	105
29	505	580	705	620	......	1,000	2,140	2,000	540	193	465	127
30	705	705	580	580	......	906	1,600	1,660	381	193	360	78
31	5,710	......	580	457	......	1,000	......	1,360	......	183	339	.....

NOTE — Discharge for following periods, when stage was below 3.3 feet or when recorder was not in operation, determined from chain gage heights: October 1 to March 2; June 4–6, 12–20, 22–26, 29 to July 22; July 24 to August 17; August 22 to September 30.

Monthly discharge of Genesee River at St. Helena, for the year ending September 30, 1919.
[Drainage area, 992 square miles]

MONTH	DISCHARGE IN SECOND-FEET				RUN-OFF
	Maximum	Minimum	Mean	Per square mile	Depth in inches on drainage area
October	5,710	211	573	.578	.67
November	3,220	416	1,120	1.13	1.26
December	3,650	470	1,290	1.30	1.50
January	5,360	457	999	1.01	1.16
February	1,140	203	404	.407	.42
March	4,970	730	1,540	1.55	1.79
April	9,800	730	2,400	2.42	2.70
May	23,800	1,100	4,830	4.87	5.62
June	1,800	238	722	.728	.81
July	1,300	111	242	.243	.28
August	2,290	119	464	.468	.54
September	465	78	218	.220	.25
The year	23,800	78	1,240	1.25	17.00

GENESEE RIVER AT JONES BRIDGE, NEAR MOUNT MORRIS

Location.—At highway bridge known as Jones Bridge, 1½ miles below Canaseraga Creek, 1¾ miles above mouth of Beads Creek, 5 miles below Mt. Morris, Livingston County, and 6 miles by river above Geneseo.

Drainage area.— 1,400 square miles.

Records available.— May 22, 1903, to April 30, 1906; August 12, 1908, to December 31, 1913; July 12, 1915, to September 30, 1919.

Gage.— Gurley 7-day graph water-stage recorder installed September 11, 1915, on right bank 60 feet downstream from bridge. Prior to 1915 a chain gage fastened to upstream side of highway bridge was used. Datum of water-stage recorder, 2.73 feet higher than that of chain gage (540.00 feet Conservation Commission datum). Recorder inspected by Theron S. Trewer.

Discharge measurements.— Made from footbridge erected on lower chord of upstream bridge truss.

Channel and control.— Sandy clay; likely to shift but, as shown by discharge measurements, fairly permanent in recent years.

Extremes of discharge.— Maximum stage during year, from water-stage recorder, 24.45 feet at 2 A. M. May 23 (discharge 32,000 second-feet); minimum stage, from water-stage recorder, 0.95 foot at 5 P. M. September 29 (discharge, 165 second-feet).

1902–1919: Maximum stage recorded, 25.44 feet at noon May 17, 1916 (discharge, 55,100 second-feet); minimum stage recorded 2.7 feet at 6 P. M. August 29, 1909 (discharge about 18 second-feet). See paragraph headed "Records Available" for limits of periods of no records.

Ice.— Stage-discharge relation affected by ice.

Regulation.— Some diurnal fluctuation due to operation of mills at Mt. Morris is observable during extremely low water.

Accuracy.— Stage-discharge relation practically permanent between dates of shifting; usually affected by ice for much of January, February and March. Rating curve well defined between 150 and 7,000 second-feet and fairly well defined between 7,000 and 60,000 second-feet. Operation of water-stage recorder satisfactory throughout year. Daily discharge ascertained by applying to rating table mean daily gage height obtained by inspecting recorder graph or, for days of considerable fluctuation, by discharge integrator.

Discharge measurements of Genesee River at Jones Bridge, near Mt. Morris, during the year ending September 30, 1919.

DATE	Made by	Gage height	Discharge
		Feet	*Sec.-ft.*
Jan. 24	E. D. Burchard	3.83	1,510
Mar. 4	do	2.96	1,060
April 14	J. W. Moulton	7.93	4,130
May 13	O. W. Hartwell	13.86	7,960
14	do	10.50	5,930
24	J. W. Moulton	21.98	14,300
26	do	15.35	8,960
June 14	do	2.42	808
Aug. 18	A. H. Davison	6.12	3,350
20	do	3.62	1,650
Sept. 10	do	1.37	311

Daily discharge, in second-feet, of Genesee River at Jones Bridge, near Mt. Morris, for the year ending September 30, 1919

DAY	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1	560	3,310	815	1,110	615	1,250	1,220	1,720	1,720	590	265	565
2	545	2,150	790	4,470	603	2,200	1,030	1,720	1,540	506	260	515
3	535	1,780	665	2,970	637	1,360	1,030	1,540	1,330	448	312	438
4	565	1,420	615	1,480	615	1,080	1,140	1,300	1,170	399	298	403
5	565	2,210	665	1,200	615	1,220	1,540	1,660	1,080	349	268	443
6	590	1,840	665	1,000	590	1,600	1,720	1,660	1,030	312	264	434
7	865	1,300	590	1,000	465	1,360	1,540	1,300	1,360	310	303	361
8	892	1,110	665	1,100	448	1,300	1,480	1,300	1,720	300	515	353
9	715	975	3,040	1,100	443	2,040	2,800	1,300	2,820	300	399	323
10	615	865	1,960	1,000	461	4,830	5,380	8,580	2,480	300	337	295
11	540	892	1,300	950	445	3,100	12,400	20,500	1,600	300	312	285
12	506	840	1,170	850	365	2,220	15,800	13,500	1,170	305	292	305
13	484	765	1,200	850	394	2,150	8,920	8,630	948	530	284	380
14	540	690	1,800	1,000	456	1,360	5,010	5,420	790	570	258	330
15	525	640	3,100	1,100	966	1,170	3,280	3,780	690	600	241	312
16	506	590	2,820	1,100	1,060	1,250	3,440	2,890	665	415	235	305
17	470	555	1,900	1,100	765	4,350	3,680	3,640	665	312	364	288
18	421	992	1,480	1,100	615	5,930	2,890	5,070	640	302	1,990	278
19	403	3,380	1,220	1,000	535	4,190	2,410	2,940	565	281	1,850	264
20	385	2,480	1,060	1,000	413	2,480	2,020	2,890	525	270	1,380	271
21	416	1,900	975	950	515	2,080	1,900	13,200	484	264	948	280
22	530	1,660	920	1,000	540	1,840	1,840	22,000	815	410	750	271
23	488	1,420	1,720	1,200	545	1,540	1,480	23,800	615	800	655	251
24	421	1,220	1,720	1,660	590	1,250	2,020	14,400	474	1,830	560	258
25	385	1,060	2,310	1,900	565	1,140	2,480	12,700	425	600	520	254
26	399	948	2,280	1,360	615	1,030	2,080	8,860	461	460	550	248
27	565	840	1,540	1,140	615	975	2,410	5,630	665	381	535	226
28	665	765	1,220	975	615	1,110	2,540	3,910	1,200	353	470	204
29	690	740	1,080	865	......	1,300	2,820	2,820	865	394	474	187
30	892	815	920	815	......	1,170	2,220	2,220	715	323	470	201
31	3,710	......	865	740	......	1,280	......	2,020	......	300	448	......

NOTE.— Gage heights and discharge estimated for December 1–7, December 14–16, July 7–11, 13–16, 20, 22–26, 31, August 2, 7, 17, 18, September 13, 14, 21. Stage-discharge relation affected by ice January 5 to 22. Discharge estimated by comparing with hydrograph of Genesee, St. Helena and with hydrograph of sum of Genesee — St. Helena, Canaseraga Creek — Groveland Station, and Keshequa Creek, Craig Colony, Sonyea.

Monthly discharge of Genesee River at Jones Bridge, near Mt. Morris, for the year ending Sept. 30, 1919
[Drainage area, 1,400 square miles]

MONTH	Discharge in Second-feet				Run-off
	Maximum	Minimum	Mean	Per square mile	Depth in inches on drainage area
October	3,710	385	658	.470	.54
November	3,380	555	1,340	.956	1.07
December	3,100	590	1,390	.992	1.14
January	4,470	740	1,260	.900	1.04
February	1,060	365	575	.411	.43
March	5,930	975	1,970	1.41	1.63
April	15,800	1,030	3,350	2.39	2.67
May	23,800	1,300	6,550	4.68	5.40
June	2,820	425	1,040	.743	.83
July	1,830	270	446	.319	.37
August	1,990	235	542	.398	.46
September	565	187	318	.227	.25
The year	23,800	187	1,620	1.16	15.83

Canaseraga Creek Near Dansville

Location.—At highway bridge 1 mile west of Dansville, Livingston County, 2,200 feet below mouth of Mill Brook and about 22 miles above mouth of creek.

Drainage area.— 158 square miles (measured by engineers of the State of New York Conservation Commission).

Records available.— July 21, 1910, to December 31, 1912; July 10, 1915, to June 30, 1917; March 10, 1919, to June 17, 1919, when the station was discontinued.

Gage.— Vertical staff at downstream side of left abutment. Gage read by C. W. Maloney.

Discharge measurements.— Made from bridge or by wading.

Channel and control.— Sand and gravel; shifting frequently.

Extremes of discharge.— Maximum stage recorded during period of record 12 feet at 8 A. M. May 22 (discharge, 3,500 second-feet); minimum stage recorded 6.2 feet several times in March (discharge, 120 second-feet).

1910–1912, 1915–1917– and 1919: Maximum stage recorded, 13.0 feet at 9:30 P. M. May 16, 1916 (discharge, determined from logarithmic extension of rating curve roughly, 6,600 second-feet); minimum stage recorded, 5.2 feet several times during October and November, 1916 (discharge about 15 second-feet).

Ice.— Stage-discharge relation affected by ice.

Accuracy.— Rating curve not well defined. Gage read to half tenths twice daily.

Discharge measurements of Canaseraga Creek near Dansville, during the year ending September 30, 1919

DATE	Made by	Gage height	Discharge
		Feet	*Sec.-ft.*
April 12	J. W. Moulton	8.04	943
12	do	7.82	837
15	do	6.70	262
May 13	do	7.48	595
23	C. C. Covert	9.08	1,610
27	J. W. Moulton	7.42	462
June 12	do	6.68	135
Aug. 20	A. H. Davison	6.31	57.1
20	do	6.33	64.7
Sept. 11	do	6.12	30.7

Daily discharge, in second-feet, of Canaseraga Creek near Dansville, for the year ending September 30, 1919

DAY	Mar.	April	May	June	DAY	Mar.	April	May	June
1	......	155	260	162	17	450	240	476	......
2	......	180	210	162	18	586	210	340	......
3	......	139	175	148	19	320	180	240	......
4	......	210	a178	122	20	210	155	280	......
5	......	260	180	a122	21	180	160	1,490	......
6	......	210	151	122	22	168	139	a2,630	......
7	......	210	145	193	23	135	132	1,710	......
8	......	180	139	134	24	131	360	1,620	......
9	......	280	210	592	25	119	280	856	......
10	320	792	2,070	483	26	115	210	536	......
11	240	1,400	1,680	162	27	115	210	410	......
12	195	930	930	122	28	119	240	301	......
13	155	450	614	122	29	125	340	263	......
14	135	340	403	87	30	131	280	227	......
15	135	260	320	98	31	151	......	193	......
16	240	280	280	98					

a Estimated by comparison with discharge at Cumminsville.

Monthly discharge of Canaseraga Creek near Dansville, for the year ending September 30, 1919
[Drainage area, 158 square miles]

MONTH	DISCHARGE IN SECOND-FEET				RUN-OFF
	Maximum	Minimum	Mean	Per square mile	Depth in inches on drainage area
April	1,400	132	314	1.99	2.22
May	2,630	139	630	3.99	4.60

CANASERAGA CREEK AT CUMMINSVILLE

Location.—At bridge on State road in village of Cumminsville, Livingston County, about one mile downstream from station maintained as "Canaseraga Creek near Dansville" about 1½ miles below Mill Brook and 21 miles above mouth of creek.

Drainage area.— 160 square miles (measured by State Conservation Commission).

Records available.— October 23, 1917, to September 30, 1919, at this station; and at station near Dansville July 21, 1910, to December 31, 1912, and July 10, 1915, to December 29, 1917.

Gage.— Vertical staff gage in three sections on downstream face of bridge pier graduated from 0 to 10.0. Read by George Freed.

Discharge measurements.— Made by wading below control at low and medium stages and from downstream side of bridge at gage during high water.

Channel and control.— Rather well compacted gravel and small boulders, practically permanent between dates of shift but liable to shift during severe floods.

Extremes of discharge.— Maximum stage recorded during year 6.8 feet at 8:30 A. M. May 22 (discharge, 6,540 second-feet); minimum stage recorded 0.50 foot several days in September (discharge, 21 second-feet).

1917–1919: Maximum stage recorded, 6.8 feet at 8:30 A. M. May 22, 1919 (discharge, 6,540 second-feet); minimum stage recorded, 0.50 foot several days in September, 1919 (discharge, 21 second-feet).

Ice.— Stage-discharge relation affected by ice.

Accuracy.— Stage-discharge relation probably permanent between dates of shift; usually affected by ice during a large part of the period from December to March. Gage read to tenths twice daily.

Cooperation.— Station established and maintained by the United States Geological Survey in cooperation with the State Conservation Commission.

Discharge measurements of Canaseraga Creek at Cumminsville, during the year ending Sept. 30, 1919

DATE	Made by	Gage height	Discharge
		Feet	*Sec.-ft.*
Jan. 25	E. D. Burchard	1.07	61.0
Mar. 31	J. W. Moulton	1.39	138
June 13	do	1.17	116
13	do	1.16	121
23	do	1.00	80.6
Aug. 19	A. H. Davison	1.00	70.7
19	do	0.97	66.2
Sept. 11	do	0.72	41.8
11	do	0.82	46.8
11	do	0.73	38.1

Daily discharge, in second-feet, of Canaseraga Creek at Cumminsville, for the year ending Sept. 30, 1918

DAY	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1	......	324	82	140	40	520	153	71	116	36	36	21
2	......	286	82	140	34	491	153	68	90	36	36	21
3	......	222	82	200	34	462	153	66	66	32	36	21
4	......	196	86	140	40	378	145	66	66	27	27	21
5	......	201	84	120	40	406	122	66	66	27	32	24
6	......	196	82	120	34	645	122	66	66	27	27	27
7	......	184	82	90	46	434	138	63	66	27	27	27
8	......	141	80	55	40	491	157	122	66	27	27	27
9	......	141	100	55	40	406	157	90	66	32	27	27
10	......	130	85	65	40	1,080	130	116	66	49	27	27
11	......	126	85	55	120	434	116	142	58	49	49	27
12	......	123	80	100	700	925	119	122	161	36	42	27
13	......	116	75	90	650	815	142	122	106	36	27	36
14	......	110	110	55	580	2,190	350	122	90	36	27	27
15	......	113	90	55	1,170	815	491	100	66	36	27	27
16	......	104	85	55	462	406	406	90	49	36	27	36
17	......	104	85	45	294	378	294	76	49	32	27	49
18	......	104	85	30	294	245	434	76	49	36	27	36
19	......	107	160	34	1,080	245	305	73	36	36	27	27
20	......	95	150	40	2,080	265	224	103	36	36	27	161
21	......	89	116	38	350	279	289	122	36	27	21	66
22	......	107	116	40	294	367	241	122	49	27	21	42
23	......	110	110	40	294	279	173	122	49	27	21	36
24	......	101	126	40	294	224	153	161	49	27	21	36
25	......	92	172	55	322	165	153	138	49	49	21	36
26	......	86	150	46	1,130	130	122	122	42	42	21	36
27	......	86	190	40	678	126	109	122	36	36	21	36
28	853	86	140	32	350	122	90	112	36	36	21	36
29	1,060	82	160	30	......	145	90	122	36	36	21	36
30	1,060	82	190	34	......	145	80	138	36	49	21	36
31	658	......	160	40	......	153	......	122	......	36	27	......

Daily discharge, in second-feet, of Canaseraga Creek at Cumminsville, for the year ending September 30, 1919

DAY	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1......	36	58	27	90	49	550	122	202	207	71	56	56
2......	36	36	27	460	66	294	122	198	165	56	56	44
3......	32	36	27	202	49	224	142	194	165	56	44	44
4......	27	36	27	49	36	161	245	194	128	56	44	40
5......	27	36	27	49	36	161	250	190	128	44	40	35
6......	36	36	27	49	36	122	250	161	128	44	35	27
7......	36	36	36	49	36	122	236	153	128	44	35	27
8......	36	36	66	49	27	122	194	142	161	44	35	27
9......	36	36	202	66	36	430	339	126	470	44	35	27
10......	36	36	90	106	36	294	1,000	1,350	378	44	27	27
11......	27	36	49	122	32	245	1,350	1,080	278	71	27	27
12......	27	36	49	90	27	202	1,000	780	212	56	27	50
13......	36	32	36	90	27	161	645	520	146	56	27	44
14......	36	27	36	142	36	161	350	322	115	56	27	44
15......	36	27	42	122	36	161	250	241	96	50	27	44
16......	27	27	49	90	36	200	284	241	96	44	27	44
17......	27	32	36	90	36	400	265	250	91	44	146	35
18......	27	224	36	90	32	580	202	211	112	44	112	35
19......	27	182	36	66	27	350	173	186	94	44	112	35
20......	27	122	36	66	32	220	161	169	88	50	71	31
21......	36	90	36	66	36	160	165	1,450	71	84	56	27
22......	32	90	36	66	36	122	153	3,210	71	207	64	21
23......	27	49	106	66	49	122	122	1,550	71	128	71	27
24......	27	49	142	49	49	122	460	1,190	71	84	56	27
25......	27	49	106	42	49	130	322	940	65	71	64	27
26......	27	36	122	36	49	130	245	755	96	64	56	21
27......	27	36	90	36	49	103	270	470	230	56	44	21
28......	27	36	90	36	49	106	250	345	146	56	44	21
29......	27	36	90	36	......	100	274	303	112	50	44	21
30......	32	36	78	36	......	119	232	263	84	44	44	21
31......	142	......	66	36	......	165	......	239	......	44	56	......

NOTE.— Discharge estimated March 16 to 21, on basis of discharge of Canaseraga at Dansville' and at Groveland Station.

Monthly discharge of Canaseraga Creek at Cumminsville, for the year ending September 30, 1918

[Drainage area, 160 square miles]

MONTH	DISCHARGE IN SECOND-FEET				RUN-OFF
	Maximum	Minimum	Mean	Per square mile	Depth in inches on drainage area
November..........................	324	82	135	.844	.94
December..........................	190	75	112	.700	.81
January..........................	200	30	68.4	.428	.49
February..........................	2,080	34	412	2.58	2.69
March..........................	2,190	122	457	2.86	3.30
April..........................	491	80	194	1.21	1.35
May..........................	161	63	104	.650	.75
June..........................	161	36	61.7	.386	.43
July..........................	49	27	34.9	.218	.25
August..........................	49	21	27.3	.171	.20
September..........................	161	21	36.4	.228	.25

Monthly discharge of Canaseraga Creek at Cumminsville, for the year ending September 30, 1919
[Drainage area, 160 square miles]

MONTH	DISCHARGE IN SECOND-FEET				RUN-OFF
	Maximum	Minimum	Mean	Per square mile	Depth in inches on drainage area
October	142	27	34.4	.215	.25
November	224	27	54.5	.341	.38
December	202	27	62.0	.388	.45
January	460	36	85.2	.532	.61
February	66	27	39.1	.244	.25
March	580	100	211	1.32	1.52
April	1,350	122	336	2.10	2.34
May	3,210	126	569	3.56	4.10
June	470	65	147	.919	1.03
July	207	44	61.5	.384	.44
August	146	27	51.9	.324	.37
September	56	21	32.6	.204	.23
The year	3,210	21	141	.881	11.97

CANASERAGA CREEK AT GROVELAND STATION

Location.—At highway bridge at Groveland Station, Livingston County.

Drainage area.— 184 square miles (measured by engineers of State of New York Conservation Commission).

Records available.—August 5, 1915, to September 30, 1916; March 1, 1917, to September 30, 1919.

Gage.— Chain gage near center of downstream side of bridge. Prior to March 30, 1916, inclined staff on right bank about 400 feet above bridge, at practically same datum (560.00 feet, Conservation Commission datum). Gage read by Thomas Maimone.

Discharge measurements.— Made from highway bridge or by wading.

Channel and control.— Creek flows through improved channel which is in gravel and is likely to shift.

Extremes of discharge.— Maximum stage recorded during year, 18.05 feet at 9:20 A. M. May 22 (discharge, 4,380 second-feet); minimum stage recorded, 6.3 feet at 7 A. M. November 12, and at 6 P. M. November 16 (discharge, 19 second-feet).

1915–1919: Maximum stage recorded May 22, 1919 (discharge, 4,380 second-feet); minimum stage recorded 6.3 feet at 7 A. M. November 12, 1918, and at 6 P. M. November 16, 1918 (discharge, 19 second-feet).

Ice.— Stage-discharge relation affected by ice.

Accuracy.— Stage-discharge relation permanent; usually affected by ice December to March. Rating curve well defined between 35 and 3,000 second-feet. Gage read to half-tenths twice daily. Daily discharge ascertained by applying mean daily gage height to rating table. Records good except those for floods of several days' duration, when stage-discharge relation may be affected by backwater.

Discharge measurements of Canaseraga Creek at Groveland Station, during the year ending September 30, 1919

DATE	Made by	Gage height	Discharge
		Feet	*Sec.-ft.*
Jan. 25.......	E. D. Burchard..	7.32	102
Mar. 31.......	J. W. Moulton..	7.80	167
April 12.......	do	12.23	1,020
12.......	do	11.62	893
13.......	do	10.01	557
May 13.......	O. W. Hartwell..	10.71	680
23.......	do	13.76	1,610
24.......	do	12.80	1,190
25.......	J. W. Moulton..	12.27	1,080
26.......	do	10.55	649
27.......	do	9.84	510
June 11.......	do	8.16	192
23.......	do	7.19	82.0
July 21.......	C. C. Covert..	7.34	109
23.......	do	7.32	104
Aug. 19.......	A. H. Davison..	7.31	97.3
Sept. 10.......	do	6.80	49.5

Daily discharge, in second-feet, of Canaseraga Creek at Groveland Station, for the year ending September 30, 1919

DAY	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1......	39	196	48	196	54	429	152	275	227	79	42	58
2......	33	138	63	341	70	138	132	275	211	67	52	52
3......	42	106	54	174	50	112	188	243	196	83	60	52
4......	34	100	48	112	65	112	275	211	174	54	65	44
5......	33	106	52	94	56	125	243	196	152	55	58	44
6......	65	100	63	112	52	138	196	181	188	76	52	44
7......	88	112	63	125	63	145	227	166	275	63	50	44
8......	65	106	63	132	67	152	196	166	324	56	54	42
9......	54	65	259	118	54	500	291	166	525	50	44	46
10......	46	52	181	70	52	375	835	1,680	307	65	44	46
11......	39	33	166	88	46	291	1,480	1,740	227	100	44	58
12......	34	25	138	106	50	211	1,060	1,020	181	76	50	65
13......	34	25	112	138	48	227	411	660	152	63	42	58
14......	32	25	211	138	60	112	370	466	112	48	34	50
15......	29	25	307	181	90	132	300	358	125	52	33	54
16......	32	25	196	138	56	196	340	307	125	76	30	48
17......	34	40	145	138	56	485	300	560	166	54	145	50
18......	32	166	112	112	58	580	240	375	125	60	106	58
19......	36	243	100	100	76	393	210	291	100	88	100	50
20......	35	152	88	106	82	358	227	358	112	56	76	57
21......	40	138	76	88	54	181	196	1,950	100	100	65	46
22......	40	112	70	76	54	138	181	2,790	94	259	60	44
23......	45	88	145	112	65	125	145	1,950	88	100	52	42
24......	45	65	240	196	58	112	485	1,350	88	82	56	40
25......	45	76	340	112	50	100	291	970	152	76	58	42
26......	45	63	180	106	46	100	275	680	181	56	63	36
27......	45	58	140	112	54	112	307	525	125	48	54	34
28......	50	50	110	76	70	125	324	411	112	48	65	34
29......	115	50	100	76	......	138	375	375	100	42	65	34
30......	250	58	100	76	......	138	291	324	76	43	76	34
31......	341	......	112	54	......	159	......	259	......	42	63	......

NOTE.— Stage-discharge relation not affected by ice. Discharge estimated on basis of discharge of Canaseraga Creek at Cumminsville for the following dates: October 20–30, November 12–16, December 7, 24–28, February 12–15, March 9, April 14–19, July 1–5, 29–31, August 1–2, September 20–21.

Monthly discharge of Canaseraga Creek at Groveland Station, for the year ending September 30, 1919
[Drainage area, 184 square miles]

MONTH	DISCHARGE IN SECOND-FEET				RUN-OFF
	Maximum	Minimum	Mean	Per square mile	Depth in inches on drainage area
October	341	29	61.2	.333	.38
November	243	25	86.6	.471	.53
December	340	48	132	.718	.83
January	341	54	123	.668	.77
February	90	46	59.1	.321	.33
March	580	100	214	1.16	1.34
April	1,480	132	351	1.90	2.12
May	2,790	166	686	3.73	4.30
June	525	76	171	.930	1.04
July	259	42	71.5	.389	.45
August	145	30	59.9	.326	.38
September	65	34	46.8	.254	.28
The year	2,790	25	173	.940	12.75

CANASERAGA CREEK AT SHAKERS CROSSING

Location.—At highway bridge at Shakers Crossing, about a mile above mouth, and 1¼ miles northeast of Mt. Morris, Livingston County.

Drainage area.— 335 square miles (measured by engineers of New York State Conservation Commission).

Records available.— Occasional current-meter measurements 1904–1915: Continuous record of gage height and occasional current-meter measurements July 13, 1915, to September 30, 1919.

Gage.— Gurley 7-day graph water-stage recorder on the left bank, just below bridge. Datum of gage same as that established on Genesee River at Jones Bridge near Mt. Morris July 12, 1915 (540.00 feet Conservation Commission datum). Recorder inspected by Mrs. Wm. Russell.

Discharge measurements.— Made from the highway bridge or by wading.

Channel and control.— Firm gravel; not likely to shift; subject to backwater from Genesee River.

Ice.— Stage-discharge relation affected by ice.

Extremes of stage.— Maximum stage during year, from water-stage recorder, 27.2 feet at 3 A. M. May 23; minimum stage, from water-stage recorder, 7.95 feet at midnight September 30.

1915–1919: Maximum stage from water-stage recorder, 28.92 feet at 1 P. M. May 17, 1916; minimum stage, from water-stage recorder, 7.86 feet at 6 P. M. August 31, 1918.

Data on extent and duration of backwater from Genesee River too meager to permit accurate determination of discharge.

Discharge measurements of Canaseraga Creek at Shakers Crossing, during the year ending Sept. 30, 1919

DATE	Made by	Gage height	Discharge
		Feet	*Sec.-ft.*
Mar. 4	E. D. Burchard	9.19	256
April 1	J. W. Moulton	9.38	301
14	do	12.87	1,100
16	do	11.30	719
May 13*a*	do	17.22	3,180
23*a*	C. S. DeGolyer	16.88	6,360
26	J. W. Moulton	19.18	3,729
June 13	do	9.32	316

a Considerable backwater from Genesee River.

Daily gage height in feet, of Canaseraga Creek at Shakers Crossing, for the year ending September 30, 1919

DAY	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1.....	8.64	10.98	8.80	9.06	8.76	9.75	9.45	10.07	9.83	......	......	8.57
2.....	8.64	......	8.76	12.36	8.84	9.75	9.37	10.15	9.41	......	......	8.54
3.....	8.64	......	8.76	10.25	9.00	9.12	9.49	9.80	9.59	......	......	8.53
4.....	8.65	......	8.81	9.18	8.94	9.14	9.83	9.53	9.46	......	......	8.48
5.....	8.50	......	8.93	9.59	8.80	9.30	10,21	9.87	9.45	......	......	8.48
6.....	8.90	......	8.94	9.85	8.75	9.47	10.03	9.72	9.49	......	......	8.48
7.....	9.27	......	9.00	9.46	8.85	9.26	9.94	9.47	10.13	......	......	8.40
8.....	9.11	......	9.06	9.34	8.84	9.33	9.81	9.43	9.84	......	......	8.47
9.....	8.99	......	10.94	9.57	8.76	10.32	10.87	9.60	11.97	......	......	8.43
10.....	8.96	......	9.79	9.97	8.71	10.91	13.41	17.08	10.78	......	......	8.37
11.....	8.92	......	9.16	10.06	8.81	11.19	19.18	25.07	9.72	......	......	8.38
12.....	8.88	......	9.16	......	8.75	10.28	21.57	21.88	9.51	......	......	8.50
13.....	8.87	8.70	9.16	......	8.76	10.15	16.25	18.01	9.38	......	......	8.62
14.....	8.82	8.55	9.64	......	8.76	9.41	13.60	14.65	9.19	......	......	8.52
15.....	8.78	8.90	10.80	......	9.11	9.49	11.33	12.33	9.12	......	......	8.47
16.....	8.83	8.89	10.55	......	8.85	9.75	11.46	11.27	9.09	......	......	8.45
17.....	8.83	8.85	9.66	......	8.85	12.66	11.48	12.09	9.26	......	9.07	8.42
18.....	8.74	9.55	9.32	......	8.79	14.01	10.70	12.84	9.07	......	9.76	8.43
19.....	8.76	11.08	9.13	9.23	8.84	12.10	10.25	10.95	8.99	......	9.18	8.36
20.....	8.90	10.01	9.03	9.15	9.00	10.47	9.68	11.08	9.02	......	8.73	8.23
21.....	8.86	9.59	8.98	9.08	8.84	10.10	9.85	19.68	8.96	......	8.50	8.26
22.....	8.76	9.37	8.94	9.12	8.82	9.77	9.65	25.63	8.90	......	8.46	8.26
23.....	8.74	9.20	9.50	9.30	8.81	9.42	9.37	26.48	8.73	......	8.40	8.29
24.....	8.70	9.05	9.46	9.75	8.82	9.34	......	24.52	8.82	......	8.38	8.33
25.....	8.70	8.95	10.45	9.50	8.91	9.21	......	22.61	8.81	......	8.46	8.33
26.....	8.75	8.89	10.16	9.26	8.83	9.22	......	18.67	8.91	......	8.50	8.29
27.....	8.86	8.83	9.41	9.01	8.82	9.24	10.49	14.93	9.21	......	8.42	8.20
28.....	8.87	8.80	9.18	8.88	9.16	9.45	10.66	12.56	9.20	......	8.43	8.22
29.....	8.84	8.80	9.12	8.91	......	9.58	11.15	11.12	......	......	8.52	8.01
30.....	8.89	8.87	8.98	8.82	......	9.38	10.46	10.51	......	......	8.57	8.04
31.....	11.67	......	8.85	8.80	......	9.70	......	10.15	......	......	8.60	......

NOTE.— Water-stage recorder not in operation November 2 to 12, January 12 to 18, April 24 to 26; intake obstructed by silt June 29 to August 16 — gage height record uncertain.

KESHEQUA CREEK AT CRAIG COLONY, NEAR SONYEA

Location.—About 200 feet downstream from private highway bridge, on grounds of Craig Colony at Sonyea, Livingston County.

Drainage area.— 70 square miles (measured by the State Conservation Commission).

Records available.— October 31, 1917, to September 30, 1919. Records were obtained from July 22, 1910, to December 31, 1912, at a site about 200 feet upstream, and from August 29, 1915, to October 31, 1917, at a station about one mile downstream near the D. L. & W. railroad bridge.

Gages.— Vertical staff gage in three sections on retaining wall on left bank just above control graduated from 0 to 10.1 installed October 27, 1917. Read by A. J. Porter.

Discharge Measurements.— Low water measurements made by wading above the gage. Highwater measurements made from downstream side of bridge.

Control.— Double-crested concrete weir built by Craig Colony for maintaining water level for their pumping plant; permanent.

Extremes of discharge.— Maximum stage recorded during year, 5.9 feet at 10 A. M. May 22 (discharge 5,940 second-feet); minimum stage recorded, 0.22 foot several times in August and September (discharge, 1.78 second-feet).

1917–1919: Maximum stage recorded, 5.9 feet May 22, 1919 (discharge, 5,940 second-feet); minimum stage recorded, 0.13 foot at 8 A. M. August 20, 1918 (discharge, 0.7 second-foot).

Ice.— Stage-discharge relation slightly affected by ice.

Accuracy.— Stage-discharge relation permanent. Rating curve well defined from 0 to 450 second-feet. Gage read to hundredths twice daily. Daily discharge determined by applying mean daily gage height to rating table. Results good.

Cooperation.— Station established and maintained by the United States Geological Survey in cooperation with the State Conservation Commission.

Discharge measurements of Keshequa Creek at Craig Colony, Sonyea, during the year ending September 30, 1919.

DATE	Made by	[a] Gage height	Discharge
		Feet	*Sec.-ft.*
Jan. 25	E. D. Burchard	0.72	28.1
April 1[a]	J. W. Moulton	0.60	16.5
14	do	1.60	251
15	do	0.99	67.8
May 13	do	1.45	205
23	O. W. Hartwell	1.74	317
27	J. W. Moulton	1.07	86.1
June 11	do	0.84	45.3
13	do	0.68	24.9
23	do	0.45	9.98

[a] Some shore ice.

Daily discharge, in second-feet, of Keshequa Creek at Craig Colony, Sonyea, for the year ending September 30, 1919.

DAY	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1	5.6	33	8.6	20	9.6	56	18	56	28	7.8	4.1	12.0
2	5.9	24	15	88	8.2	21	23	54	26	7.4	7.4	6.3
3	7.0	22	11	34	9.6	22	25	40	23	7.0	3.0	7.8
4	7.8	18	9.6	11	12	21	33	37	19	6.6	2.0	6.6
5	6.3	35	12	26	11	33	45	51	30	6.3	4.1	7.0
6	4.5	23	12	35	9.6	26	34	38	22	5.2	5.2	6,3
7	30	17	8.6	38	10	16	40	30	97	6.3	7.4	3.4
8	18	15	13	30	9.6	17	36	28	90	5.6	2.0	2.6
9	11	13	48	23	8.6	142	90	37	290	5.6	2.8	3.4
10	8.6	13	22	18	5.6	102	234	1,080	70	4.8	2.0	3.4
11	7.8	12	18	15	7.8	77	660	590	40	7.0	2.0	3.8
12	7.4	10	17	16	9.1	54	258	325	33	7.0	2.2	8.6
13	8.2	11	20	17	8.2	56	142	176	25	4.8	4.1	17
14	8.6	10	41	23	12	20	100	95	21	4.5	3.4	7.8
15	8.2	8.6	70	30	25	28	68	70	26	5.2	2.8	6.3
16	7.8	8.6	43	21	11	47	110	60	20	14	2.4	7.4
17	7.0	8.6	28	21	11	164	79	120	18	7.8	37	6.3
18	6.6	17	23	20	8.6	187	61	86	15	7.0	22	6.3
19	4.8	33	19	23	9.6	72	48	56	13	5.6	25	5.6
20	6.3	19	15	17	8.6	50	51	154	10	4.1	11	5.9
21	9.1	16	17	18	13	45	45	660	12	7.0	9.6	6.3
22	9.1	16	16	21	13	36	33	1,850	9.1	15	7.0	3.2
23	8.6	15	26	30	17	28	28	362	10	8.6	4.1	5.9
24	8.6	13	22	58	15	35	128	263	7.4	6.3	5.6	5.6
25	8.6	12	79	34	14	24	77	204	9.6	4.5	6.3	4.5
26	7.0	11	40	23	13	23	72	105	12	5.6	9.6	4.1
27	9.6	9.1	25	19	9.6	23	90	86	17	3.0	6.3	4.1
28	9.6	6.6	20	16	11	33	77	63	14	4.1	9.1	2.8
29	14	10	17	17	......	25	110	50	11	4.5	9.6	4.8
30	50	12	14	13	......	30	65	40	11	3.4	8.2	1.8
31	86	......	15	12	......	37	......	35	......	2.8	10	......

NOTE.— Stage-discharge relation not affected by ice.
Discharge estimated October 24 and 30, December 1–3; by comparing with hydrographs of Canaseraga, Cumminsville and Canaseraga, Groveland Station.

Monthly discharge of Keshequa Creek, at Craig Colony near Sonyea, for the year ending September 30, 1919.

[Drainage area, 70 square miles]

MONTH	DISCHARGE IN SECOND-FEET				RUN-OFF
	Maximum	Minimum	Mean	Per square mile	Depth in inches on drainage area
October	86	4.5	12.8	.183	.21
November	35	6.6	15.7	.224	.25
December	79	8.6	24.0	.343	.40
January	88	11	25.4	.363	.42
February	25	5.6	11.1	.159	.17
March	187	16	50.0	.714	.82
April	660	18	96.0	1.37	1.53
May	1,850	28	223	3.19	3.68
June	290	7.4	34.3	.490	.55
July	15	2.8	6.27	.088	.10
August	37	2.0	7.65	.109	.13
September	17	1.8	5.90	.084	.09
The year	1,850	1.8	43.0	.614	8.36

CANADICE LAKE OUTLET NEAR HEMLOCK

Location.—At foot of Canadice Lake, Livingston County. Outlet flows into Genesee River through Canadice Lake Outlet and Honeoye Creek.

Drainage area.— 12.6 square miles, of which 1.0 square mile is lake surface.

Records available.—April, 1903, to September 30, 1919.

Gage.— Hook, in channel above weir.

Channel and control.— Outflow is measured over a standard thin-edged weir with a 5-foot crest and two end contractions so arranged with needle timbers at the ends that the length may be increased to 14.96 feet. No end contractions during high water. The weir crest stands 3.14 feet above the stream channel, which is artificial with a plank bottom and vertical sides, and the crest is never submerged by back-water.

Two additional rectangular gates, each one foot square with three complete contractions and a fourth incomplete contraction at the bottom.

Ice.— Stage-discharge relation not affected by ice as the pool above the weir is free from ice throughout the winter.

Diversions.— No water is diverted from Canadice Lake above the station.

Regulation.— Outflow of lake is regulated by bulkhead and gates at dam above weir.

Accuracy.— Stage-discharge relation permanent. Rating curve used is expressed by Francis formula. Corrections are made for velocity of approach for high stages. Gage read to hundredths once daily. Records good.

Cooperation.—Data collected, computed, and furnished for publication by the city engineer of Rochester.

NOTE.— Data not yet available for publication.

OWASCO OUTLET NEAR AUBURN

Location.— On the farm of Charles H. Pearce, 2 miles below center of Auburn, Cayuga County, and 3¾ miles below State dam at outlet of Owasco Lake.

Drainage area.— 206 square miles (measured on topographic maps).

Records available.— November 17, 1912, to September 30, 1919.

Gage.— Gurley water-stage recorder in a concrete shelter on left bank, on the farm of Charles H. Pearce. Recorder inspected by Charles H. Pearce.

Discharge measurements.—Made from cable directly opposite the gage, or by wading 100 feet below dam.

Channel and control.—A low concrete control has been constructed about 15 feet below the gage. Crest of control is 1 foot wide and the slopes of both upstream and downstream faces are ½:1. A small horizontal apron built on a level with the bed of the stream extends downstream 2½ feet from toe of dam. Mean elevation of the left end of the dam for a distance of 50 feet is gage height 1.28 feet; the remaining 50 feet of the crest of the dam is at a gage height 2.13 feet.

Extremes of discharge.— Maximum stage during year, from water-stage recorder, 3.55 feet at 9 A. M. April 12 (discharge, 1,160 second-feet); minimum stage, from water-stage recorder, 1.47 feet at 9:45 P. M. September 2 (discharge, 10.6 second-feet).

1912–1919: Maximum stage, 6.4 feet during period March 25–30, 1913, determined by leveling from flood marks (discharge, 2,750 second-feet); minimum stage, from water-stage recorder, 1.41 feet at 1 A. M. October 15, 1915 (discharge, 5.6 second-feet).

Ice.— Stage-discharge relation seldom affected by ice.

Diversions.—An average flow of about 10 second-feet is pumped from Owasco Lake for the municipal water supply of the city of Auburn. Proportion returning to stream above the gaging station is not known.

Regulation.— Large diurnal fluctuation in flow during low-water periods due to operation of mills in the city of Auburn; seasonal flow regulated at the State dam.

Accuracy.— Stage-discharge relation permanent; not affected by ice during year. Rating curve well defined between 1 and 1,700 second-feet. Operation of the water-stage recorder fairly satisfactory throughout year. Daily discharges ascertained by averaging the hourly discharge. Records excellent except for periods of no gage height records.

Discharge measurements of Owasco Outlet near Auburn, during the year ending September 30, 1919

DATE	Made by	Gage height	Discharge
		Feet	*Sec.-ft.*
July 28........	C. C. Covert....................................	2.45	268

Some moss on crest of dam.
Channel cleared at measured point before making measurements.

Daily discharge, in second-feet, of Owasco Outlet near Auburn, for the year ending September 30, 1919

DAY	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1.....	129	*a*	139	360	201	201	374	559	280	170	182	83
2.....	123	*a*	156	368	189	171	384	582	250	182	183	144
3.....	125	*a*	157	383	198	196	394	539	230	184	176	160
4.....	141	*a*	154	372	189	187	390	528	220	136	175	163
5.....	145	*a*	151	383	190	192	445	544	210	183	172	163
6.....	106	*a*	152	388	190	191	519	456	200	132	175	159
7.....	144	*a*	150	384	190	208	688	381	190	171	179	158
8.....	138	*a*	146	371	197	196	663	367	180	178	178	171
9.....	136	*a*	154	368	185	204	641	375	180	173	174	166
10.....	131	*a*	154	377	209	214	698	461	190	193	155	162
11.....	131	*a*	150	371	199	217	881	639	200	163	191	157
12.....	113	*a*	142	373	194	219	1,000	772	200	166	188	159
13.....	71	*a*	152	377	194	221	925	826	200	148	187	158
14.....	134	*a*	189	336	190	223	941	776	208	180	191	135
15.....	142	*a*	174	290	190	228	908	738	194	198	192	162
16.....	146	*a*	172	292	198	276	897	726	193	181	195	162
17.....	139	*a*	169	259	209	380	864	749	181	173	177	148
18.....	143	*a*	170	263	200	390	799	725	181	171	206	151
19.....	154	*a*	173	243	181	390	738	709	171	180	184	156
20.....	98	*a*	168	236	98	398	702	700	163	169	191	142
21.....	96	*a*	167	223	192	392	649	650	206	195	183	127
22.....	141	*a*	177	234	192	386	620	540	171	182	174	134
23.....	162	165	209	230	181	378	580	700	175	168	164	131
24.....	167	147	236	238	193	382	550	720	189	172	159	135
25.....	153	161	234	237	198	375	540	728	165	162	186	135
26.....	136	168	292	218	194	368	520	743	197	178	177	127
27.....	101	155	374	210	193	368	508	591	133	189	179	105
28.....	162	142	379	200	194	371	500	451	178	184	170	33
29.....	171	151	364	195	......	379	492	370	185	172	176	122
30.....	193	149	376	189	......	380	493	330	176	162	133	141
31.....	140	......	365	194	......	389	......	300	......	164	77	......

a Estimated mean daily discharge 150 second-feet.

NOTE.— Discharge estimated October 31, January 27, 28; February 5 to 7, 14, 15; April 22–26; May 20–24, 29–31; June 1–13; July 31; August 1, 5 to 8; September 3 to 6 — from precipitation and temperature records and observer's weekly readings of gage height.

Monthly discharge of Owasco Outlet near Auburn, for the year ending September 30, 1919

[Drainage area, 206 square miles]

MONTH	DISCHARGE IN SECOND-FEET				RUN-OFF
	Maximum	Minimum	Mean	Per square mile	Depth in inches on drainage area
October...........................	193	71	136	.660	.76
November...........................	....	....	151	.733	.82
December...........................	379	139	205	.995	1.15
January...........................	388	189	296	1.44	1.66
February...........................	209	98	190	.922	.96
March...........................	398	171	293	1.42	1.64
April...........................	1,000	374	643	3.12	3.48
May...........................	826	*a*300	590	2.86	3.30
June...........................	*a*280	133	193	.937	1.05
July...........................	198	132	173	.840	.97
August...........................	206	77	175	.850	.98
September...........................	171	33	142	.689	.77
The year.....................	1,000	33	266	1.29	17.54

NOTE.— *a* Estimated.

BLACK RIVER NEAR BOONVILLE

Location.—At highway bridge about 1 mile above mouth of Sugar River, 2 miles northeast of Boonville, Oneida County, and 2 miles, by river, downstream from Hawkinsville.

Drainage area.— 303 square miles (measured on topographic maps).

Records available.— February 16, 1911, to September 30, 1919.

Gage.— Chain near center of left span, downstream side of bridge; staff gage on right abutment used for high-water readings; read by W. D. Charbonneau.

Discharge measurements.— Made from a cable about half a mile above gage or by wading near the gage.

Channel and control.— Rough and full of boulders; permanent.

Extremes of discharge.— Maximum stage recorded during year, 10.2 feet at 8 A. M. April 13 (discharge, 5,810 second-feet); minimum stage recorded, 3.0 feet at 5 P. M. June 10 (discharge, 27 second-feet).

1911–1919: Maximum stage (determined by leveling from flood mark) about 12.5 feet during night of March 28, 1913 (discharge, about 10,000 second-feet); minimum stage recorded, 2.4 feet at 5 P. M. August 26, 1918 (discharge 4 second-feet).

Ice.— Stage-discharge relation affected by ice.

Regulation and diversion.— The State dam at Forestport, about 8 miles upstream, provides a reservoir with a capacity of about 2,000,000,000 cubic feet. Water is diverted from this reservoir during the navigation season through the Forestport Feeder, flowing west to a basin in Boonville. The Black River canal flows north from this basin entering Black River at the foot of Lyons Falls. A spillway from the basin overflows into Mill Creek, a tributary of Black River. Water flowing through these two channels returns to the river below the gaging station, thus passing around it. The Black River canal also flows south from Boonville, passing out of the Black River drainage and entering the summit level of the Erie canal (or Barge canal) at Rome.

Occasional discharge measurements have been made at three points to indicate the distribution of the diverted water. The water entering Boonville through the Forestport Feeder has been measured at the highway bridge about one mile northeast of Boonville. During October, 1915, two water-stage recorders were installed on this canal to obtain a continuous record of flow, which is published as a separate station "Forestport Feeder near Boonville." The water flowing north from the basin through the Black River canal has been measured at the highway bridge just below the lock into this canal near the railroad station. The water flowing south from the basin has been measured at a private farm bridge about one mile southeast of Boonville. During September, 1915, two water-stage recorders were installed on this canal to obtain a continuous record of the flow, which is published as a separate station, "Black River canal (flowing south) near Boonville."

Accuracy.— Stage-discharge relation practically permanent, usually affected by ice during a large part of the period December to March, inclusive. Rating curve well defined between 35 and 2,800 second-feet and fairly well defined between 2,800 and 4,500 second-feet. Gage read to hundredths twice daily. Daily discharge ascertained by applying mean daily gage height to rating table. Records good, except for periods when the stage-discharge relation was affected by ice, for which they are fair.

Discharge measurements of Black River near Boonville, during the year ending September 30, 1919

DATE	Made by	Gage height	Discharge
		Feet	*Sec.-ft.*
Jan. 7	M. H. Carson	5.49	608
June 7	do	3.50	66.8
8	do	3.44	61.4

Daily discharge, in second-feet, of Black River near Boonville, for the year ending September 30, 1919.

DAY	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1	305	2,270	512	630	490	855	1,140	735	320	53	194	119
2	335	2,160	535	795	450	795	1,460	920	227	46	184	111
3	352	1,640	605	1,370	430	795	1,210	1,140	184	53	111	111
4	335	1,140	580	1,640	410	680	1,140	1,370	84	40	90	145
5	470	680	535	1,060	410	630	920	1,460	42	41	72	164
6	680	630	535	580	335	490	1,060	1,640	38	63	78	119
7	920	535	630	605	335	490	1,370	1,740	31	66	63	104
8	1,060	558	630	630	320	735	1,740	2,050	33	57	104	84
9	920	580	735	580	335	1,140	1,740	1,740	36	49	84	90
10	855	490	735	605	305	1,140	1,740	1,540	28	72	62	127
11	795	390	735	535	335	1,290	2,160	1,290	33	205	60	111
12	795	512	795	470	410	1,060	3,880	990	41	227	78	97
13	605	605	855	430	450	630	5,520	855	53	154	72	104
14	490	580	855	430	795	490	4,960	735	49	111	72	145
15	238	580	920	450	990	535	4,280	795	49	97	97	145
16	184	558	1,060	450	920	1,210	3,490	680	46	119	111	136
17	145	558	920	470	735	2,160	2,620	680	46	145	104	127
18	119	430	855	470	580	1,940	1,940	795	66	194	104	111
19	164	470	920	430	450	1,460	1,370	1,060	59	205	97	97
20	275	680	855	430	390	1,460	1,140	1,060	46	205	90	127
21	735	630	920	512	335	1,140	1,060	680	51	238	78	111
22	795	490	795	535	335	795	920	680	66	216	97	145
23	580	450	1,940	580	352	990	920	535	59	194	97	127
24	535	335	2,620	512	335	1,290	795	490	49	184	111	119
25	630	194	2,270	490	335	1,060	795	558	71	194	136	97
26	855	630	1,940	450	370	920	795	580	97	227	127	111
27	990	990	1,460	535	535	855	795	680	72	305	145	104
28	795	490	1,290	580	680	855	795	605	66	630	145	111
29	680	262	1,060	630	......	680	680	580	63	680	84	111
30	990	290	735	680	......	680	680	580	56	430	97	111
31	1,940	......	580	558	......	735	......	535	......	250	111	......

NOTE.— Stage-discharge relation not affected by ice.

Monthly discharge of Black River near Boonville, for the year ending September 30, 1919.

[Drainage area, 303 square miles]

MONTH	DISCHARGE IN SECOND-FEET				RUN-OFF
	Maximum	Minimum	Mean	Per square mile	Depth in inches on drainage area
October	1,940	119	631	2.08	2.40
November	2,270	194	694	2.29	2.56
December	2,620	512	981	3.24	3.74
January	1,640	430	617	2.04	2.35
February	990	305	469	1.55	1.61
March	2,160	490	967	3.19	3.68
April	5,520	680	1,770	5.89	6.52
May	2,050	490	961	3.17	3.66
June	320	28	72	.238	.27
July	680	40	185	.611	.70
August	194	60	102	.337	.39
September	164	84	117	.386	.43
The year	5,520	28	632	2.09	28.31

BLACK RIVER AT BLACK RIVER

Location.—About one-fourth mile below concrete-arch highway bridge and power plant of Northern New York Utilities Co. and three-fourths mile below village of Black River, Jefferson County.

Drainage area.— 1,870 square miles (measured on topographic maps).

Records available.— March 24, 1917, to September 30, 1919.

Gage.— Vertical staff, in two sections, spiked to large cedar tree on left bank about one-fourth mile below highway bridge; read by Erwin W. Hart.

Discharge measurements.— Made from cable about 100 yards above gage.

Channel and control.— Solid rock.

Extremes of discharge.— Maximum stage recorded during year, 12.7 feet at 8:30 A. M. and 6:20 P. M. April 14 (discharge, 17,300 second-feet); minimum stage recorded, 2.8 feet at 8:40 A. M. July 5 (discharge, 450 second-feet).

1917–1919: Maximum stage recorded, 13.4 feet from 6 P. M. April 4 to 7 A. M April 5, 1917 (discharge, 19,300 second-feet); minimum stage recorded, 1.05 feet at 2:45 P. M. June 29, 1917 (discharge, about 16 second-feet).

Ice.— Stage-discharge relation usually affected by ice.

Regulation.— Seasonal distribution of flow is regulated by Beaver River flow, Fulton Chain lakes, Forestport reservoir and other storage reservoirs in the upper portion of the drainage basin. Some diurnal fluctuation at low stages due to mills and power plants above station.

Diversions.— Water is diverted from Black River into Forestport Feeder at Forestport. A portion of this water returns to river through various spillways and through Black River canal (flowing north). The remainder passes out of the drainage basin through Black River canal (flowing south); the record at the station on Black River canal (flowing south) at Boonville indicates the amount of this diversion. See also " Regulation and Diversion " in description of station on Black River near Boonville.

Accuracy.— Stage-discharge relation fairly permanent. Rating curve well defined between 500 and 18,000 second-feet. Gage read to tenths twice daily. Daily discharge ascertained by applying mean daily gage height to rating table. Records good except for days of low discharge, for which they may be poor.

Discharge measurements of Black River at Black River, during the year ending September 30, 1919.

DATE	Made by	Gage height	Discharge
		Feet	*Sec.-ft.*
June 8	M. H. Carson	3.98	1,370
9	do	3.90	1,360
Aug. 28	C. C. Covert	3.70	1,110

Daily discharge, in second-feet, of Black River at Black River, for the year ending September 30, 1919.

DAY	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1.....	2,990	7,610	3,250	5,510	2,730	1,900	8,770	5,190	3,830	2,030	1,220	1,040
2.....	2,860	6,880	2,600	6,180	1,900	2,120	8,180	5,520	3,410	1,920	1,130	1,500
3.....	2,120	7,610	2,860	6,880	1,470	2,360	7,990	5,520	2,740	1,500	1,040	1,220
4.....	2,240	6,880	3,390	4,870	1,470	2,860	7,240	6,390	2,620	960	920	1,040
5.....	2,480	6,350	2,860	3,950	1,570	3,120	7,990	6,030	2,030	764	840	1,220
6.....	2,730	5,190	2,600	3,670	1,680	3,120	7,990	6,570	1,400	1,600	519	1,400
7.....	4,870	4,710	2,240	4,100	1,470	3,670	9,370	6,390	1,700	2,140	654	920
8.....	5,840	3,950	2,360	3,670	1,270	3,810	9,570	6,030	1,600	2,620	801	726
9.....	5,350	3,670	2,860	3,950	680	3,390	9,780	5,520	1,400	2,260	879	801
10.....	4,550	3,120	3,250	4,100	590	4,550	10,200	4,720	1,700	1,810	879	960
11.....	3,810	3,390	3,120	2.730	590	6,180	11,100	4,270	1,040	1,310	1,040	1,040
12.....	3,120	3,530	2,730	1,790	950	6,520	12,600	4,120	960	1,400	879	1,220
13.....	2,600	3,670	2,600	1,790	1,470	5,670	14,600	5,860	1,130	1,500	960	1,400
14.....	2,360	4,250	3,670	1,900	1,790	5,840	17,300	5,350	960	2,030	801	1,600
15.....	2,360	4,400	4,100	2,240	1,900	5,190	16,800	4,870	879	1,700	690	1,600
16.....	2,240	4,100	4,250	2,120	2,360	4,400	16,200	4,570	1,220	1,130	879	960
17.....	2,600	3,810	3,950	2,240	2,600	4,550	12,400	4,120	1,310	1,220	840	1,130
18.....	2,120	4,870	3,670	2,360	2,600	5,030	10,600	4,870	1,220	1,920	726	960
19.....	2,240	6,180	3,250	2,120	2,360	10,400	10,200	6,210	1,310	1,700	726	585
20.....	2,010	7,240	2,990	2,010	2,240	10,200	9,120	7,120	1,040	1,700	879	654
21.....	3,670	6,880	2,860	2,240	1,680	10,400	7,900	6,570	960	1,810	1,220	654
22.....	4,550	6,520	2,360	1,900	1,470	10,400	7,900	6,750	960	1,810	2,030	1,400
23.....	4,100	4,550	3,390	2,120	1,900	9,780	7,500	7,310	1,130	1,600	1,600	1,810
24.....	3,530	3,250	4,550	3,120	2,240	9,990	7,500	6,390	840	1,700	1,130	2,260
25.....	2,990	3,250	5,670	4,550	2,010	8,770	7,310	5,350	1,040	1,130	1,310	2,620
26.....	3,390	3,390	8,570	4,870	2,120	8,370	6,030	5,190	1,220	1,700	960	2,870
27.....	4,870	3,390	7,990	5,350	1,680	7,990	6,030	4,870	1,310	1,310	1,220	3,130
28.....	5,510	3,670	7,060	4,550	1,470	8,370	5,350	4,570	2,030	1,040	1,130	2,260
29.....	5,350	3,250	5,840	3,950	......	8,570	5,350	3,830	1,600	1,600	1,220	2,130
30.....	6,180	3,670	6,180	3,120	......	8,180	4,870	3,410	1,810	1,920	1,810	2,040
31.....	7,060	......	5,030	2,860	......	8,770	......	3,830	......	1,600	1,500	......

Monthly discharge of Black River at Black River, for the year ending September 30, 1919

[Drainage area, 1,870 square miles]

MONTH	DISCHARGE IN SECOND-FEET				RUN-OFF
	Maximum	Minimum	Mean	Per square mile	Depth in inches on drainage area
October	7,060	2,010	3,640	1.94	2.24
November	7,610	3,120	4,770	2.55	2.84
December	8,570	2,240	3,940	2.11	2.43
January	6,880	1,790	3,450	1.84	2.12
February	2,730	590	1,720	.920	.96
March	10,400	1,900	6,270	3.35	3.86
April	17,300	4,870	9,460	5.06	5.64
May	7,310	3,410	5,400	2.89	3.33
June	3,830	840	1,550	.829	.92
July	2,620	764	1,630	.872	1.00
August	2,030	519	1,050	.560	.65
September	3,130	585	1,440	.770	.86
The year	17,300	519	3,700	1.98	26.85

FORESTPORT FEEDER NEAR BOONVILLE

Location.— Slope station at lower end of feeder, above point where it enters the basin at Boonville, Oneida County.

Records.— Occasional discharge measurements 1900 and 1905–1915, continuous record October 30, 1915, to September 30, 1919. Data published also in annual reports of New York State Engineer and Surveyor and State of New York Conservation Commission.

Gages.— Two Gurley 7-day graph water-stage recorders, with natural scale for gage heights. Gage No. 1 is at downstream end of left abutment of steel highway bridge in village of Hawkinsville; gage No. 2 is on left bank, just below a farm bridge about a mile above the basin at Boonville; they are 2.53 miles apart. The float wells are 1½ by 2 feet, inside dimensions, and the bottoms are about 1½ feet below normal elevation of water surface in canal. These gages and the two in the Black River canal (flowing south) near Boonville are all set at the same datum; recorders inspected by Chas. Nugent.

Discharge measurements.— Made from the steel highway bridge at gage No. 1 in Hawkinsville.

Determination of discharge.— Daily discharge determined by use of Chezy formula. The coefficient, "C," is computed from each current-meter measurement and is plotted on a curve showing the variation of "C" through the season. A smooth curve drawn through the plotted points shows the coefficients for intervening days. The other factors in the Chezy formula are obtained from gage-height records and cross-section of the canal.

Diversions.— One spillway takes water from the Forestport Feeder just below gage No. 2 and a second spillway takes water from the basin in Boonville. Both discharge into Mill Creek, which enters Black River below the Boonville gaging station. No spillway between gage No. 1 and gage No. 2. Other spillways in the feeder above gage No. 1 discharge into Black River above the gaging station. Therefore, this station indicates the total amount of water diverted past the gaging station on Black River near Boonville, and the sum of this record and the record for the Black River near Boonville indicates the total run-off of the Black River basin above these gaging stations.

Regulation.— Flow in the feeder is regulated at the outlet of Forestport reservoir.

Ice.— There is usually no flow in the canal during the winter season. Water was observed in the canal several times during the winters of 1917–1918 and 1918–1919, and occasional current-meter measurements of the discharge were made. See list of measurements.

Accuracy.— Records good except for days on which discharge varies widely from the mean, for which they are fair.

Discharge measurements of Forestport Feeder near Boonville, during the year ending September 30, 1919

DATE	Made by	Gage height No. 1	Gage height No. 2	Discharge
		Feet	*Feet*	*Sec.-ft.*
Oct. 18	E. D. Burchard	2.961	1.704	215
18	do	2.964	1.713	216
Nov. 10	do	3.242	1.970	258
10	do	3.248	1.967	259
Dec. 14*a*	do	....	....	66.
Jan. 7*a*	M. H. Carson	....	....	53
Feb. 18*a*	E. D. Burchard	....	....	53.2
Mar. 9*a*	do	....	....	57.8
June 6	M. H. Carson	2.919	1.58	246
8	do	3.020	1.648	257
13	do	2.696	1.587	204
27	J. W. Moulton	3.226	1.916	268
July 18	M. H. Carson	3.115	1.953	224
Aug. 11	C. C. Covert	3.063	1.760	209
29	do	3.21	1.962	196
Sept. 23	do	3.26	1.95	217

a Measurements made through complete ice cover.

Daily discharge, in second-feet, of Forestport Feeder near Boonville, for the year ending September 30, 1919.

DAY	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1	199	205	......	......	......	......	......	......	......	245	205	196
2	217	197	......	......	......	......	......	......	......	233	199	194
3	203	218	......	......	......	......	......	......	......	230	201	201
4	194	216	......	......	......	......	......	......	......	239	203	198
5	192	219	......	......	......	......	......	......	......	247	208	196
6	199	215	......	......	......	......	......	......	......	267	206	195
7	196	211	......	......	......	......	......	......	264	234	200	198
8	203	209	......	......	......	......	......	......	248	235	206	198
9	208	218	......	......	......	......	......	......	227	249	211	201
10	257	255	......	......	......	......	......	......	216	253	196	201
11	275	257	......	......	......	......	......	......	213	248	195	199
12	254	257	......	......	......	......	......	......	216	251	197	200
13	221	257	......	......	......	......	......	......	205	244	194	201
14	194	252	......	......	......	......	......	......	204	248	194	203
15	194	250	......	......	......	......	......	......	205	243	194	203
16	205	248	......	......	......	......	......	......	206	244	193	202
17	217	244	......	......	......	......	......	......	233	240	194	200
18	222	268	......	......	......	......	......	......	240	230	195	203
19	237	256	......	......	......	......	......	......	235	235	196	212
20	223	232	......	......	......	......	......	......	231	224	194	216
21	235	227	......	......	......	......	......	......	230	220	192	217
22	224	222	......	......	......	......	......	......	228	216	193	211
23	217	215	......	......	......	......	......	......	241	212	191	218
24	215	207	......	......	......	......	......	......	229	219	191	227
25	213	194	......	......	......	......	......	......	236	220	188	214
26	243	180	......	......	......	......	......	......	263	215	195	212
27	245	160	......	......	......	......	......	......	281	222	197	219
28	224	140	......	......	......	......	......	......	275	223	194	220
29	218	100	......	......	......	......	......	......	267	217	197	217
30	228	50	......	......	......	......	......	......	261	211	196	221
31	264	......	......	......	......	......	......	......	......	209	195	......

NOTE.— Discharge estimated November 26–30, August 15–16, September 11–13, 15–20, 26–27, by comparing gage height records of gages No. 1 and No. 2 and making estimate of probable slope between the gages.

Monthly discharge of Forestport Feeder near Boonville, for the year ending September 30, 1919

MONTH	DISCHARGE IN SECOND-FEET				RUN-OFF
	Maximum	Minimum	Mean	Per square mile	Depth in inches on drainage area
October	275	192	221	....	....
November	268	*	213	....	....
June	281	204	236	....	....
July	267	209	235	....	....
August	211	188	197	....	....
September	227	194	206	....	....

* Canal closed November 25, 1918.

BLACK RIVER CANAL (FLOWING SOUTH) NEAR BOONVILLE

Location.— Slope station in summit level of Black River canal, near Boonville, Oneida County.

Records available.— Occasional discharge measurements 1900 and 1905–1915; continuous record September 16, 1915, to September 30, 1919.

Gages.— Two Gurley 7-day graph water-stage recorders with natural scale for gage heights; they are 1.81 miles apart. Gage No. 1 is on right bank (opposite tow-path) about 50 feet downstream from collector's office in Boonville; gage No. 2 is on right bank (opposite tow-path) about 300 yards above Lock 70 and 50 yards above spillway from the canal into Lansing Kill. These gages and the two gages in the Forestport Feeder near Boonville are set to the same datum. Recorders inspected by Chas. Nugent.

Discharge measurements.— Made from the steel and concrete highway bridge in the village of Boonville, a short distance below gage No. 1.

Determination of discharge.— Daily discharge determined by use of Chezy formula. The coefficient "C" is computed from each current-meter measurement and plotted on a curve showing the variation of "C" through the season. A smooth curve drawn through the plotted points shows the coefficient for intervening days. The other factors in the Chezy formula are obtained from gage-height records and cross-section of canal.

Diversions.— No diversions between gage No. 1 and gage No. 2. Records obtained at this station indicate the quantity of water diverted for the canal from the Black River basin into the Mohawk River basin.

Regulation.— Flow in canal is regulated by operation of spillway and sluice gates at Lock 70 and also by discharge of Forestport Feeder into the basin at Boonville.

Ice.— No flow in canal during winter season.

Accuracy.— Records good.

Discharge measurements of Black River Canal (flowing south) near Boonville, during the year ending September 30, 1919

DATE	Made by	Gage height No. 1	Gage height No. 2	Discharge
		Feet	*Feet*	*Sec.-ft.*
Oct. 16	E. D. Burchard	1.286	1.059	137
16	do	1.286	1.062	136
Nov. 10	do	1.632	1.404	174
10	do	1.634	1.403	178
June 7	M. H. Carson	1.399	1.144	197
13	do	1.354	1.201	143
26	J. W. Moulton	1.634	1.308	228
July 18	O. W. Hartwell	1.688	1.412	180
Aug. 12	C. C. Covert	1.316	0.868	166
29	do	1.70	1.29	166
Sept. 23	do	1.631	1.196	164

Daily discharge, in second-feet, of Black River Canal (flowing south) near Boonville, for the year ending September 30, 1919.

DAY	Oct.	Nov.	June	July	Aug.	Sept.
1	138	149	......	193	162	160
2	151	151	......	184	166	175
3	132	162	......	187	158	175
4	136	158	......	177	157	178
5	133	156	......	210	164	186
6	138	155	......	184	171	187
7	123	153	167	168	169	164
8	133	151	172	165	168	160
9	127	157	183	170	162	152
10	144	175	174	178	158	164
11	152	149	152	177	164	166
12	150	166	161	177	166	160
13	137	160	144	164	162	153
14	131	152	154	163	158	163
15	133	153	157	166	159	166
16	142	155	157	158	164	167
17	66	162	183	177	168	166
18	62	168	188	182	169	174
19	151	165	185	183	170	174
20	159	151	177	177	158	170
21	155	148	163	185	160	172
22	145	137	164	176	160	172
23	134	146	181	169	167	171
24	144	159	161	175	163	185
25	146	105	201	174	164	171
26	146	75	227	175	169	174
27	135	......	226	174	171	161
28	156	......	218	180	164	165
29	146	......	205	176	166	171
30	147	......	203	172	169	165
31	152	......	......	168	162	....

NOTE.— Discharge estimated November 26–30; August 13–16, 20–23, 28, 29; September 1–6 16–20, 26, 27, by comparing gage height records of gages No. 1 and No. 2, and making estimate of probable slope between the gages.

Monthly discharge of Black River Canal (flowing south) near Boonville, for the year ending September 30, 1919

MONTH	DISCHARGE IN SECOND-FEET		
	Maximum	Minimum	Mean
October	159	62	137
November	175	....	131
June	227	144	179
July	210	158	176
August	171	158	164
September	187	152	169

MOOSE RIVER AT MOOSE RIVER

Location.— In the village of Moose River, Lewis County, about 3 miles downstream from McKeever, 5 miles below mouth of South Branch of Moose River, and nearly 20 miles above junction of Black and Moose rivers at Lyons Falls.

Drainage area.— 370 square miles (measured on topographic maps).

Records available.— June 5, 1900, to September 30, 1919.

Gage.— Staff in two sections on left bank a short distance above the cable; read by H. W. Hoch. Gage datum was lowered 0.17 foot February 28, 1903, and again 5.00 feet on January 1, 1913.

Discharge measurements.— Made from a cable a short distance below gage.

Channel and control.— Cobblestones and boulders; fairly permanent. Current smooth; depth comparatively uniform. Ice and logs occasionally jam above the station on a small island.

Extremes of discharge.— Maximum stage recorded during year 14.5 feet at 8 A. M. April 12 (discharge, 10,400 second-feet); minimum stage recorded, 5.25 feet at 8 A. M. June 27 (discharge, 93 second-feet).

1900–1919: Maximum stage recorded, 16.3 feet during the afternoon of March 27, 1913, determined by leveling from flood marks (discharge, about 16,500 second-feet); minimum stage recorded, 4.94 feet July 21, 23, 25, 26 and 27, 1913 (discharge, about 42 second-feet).

Ice.— Stage-discharge relation affected by ice.

Regulation.—A timber dam at McKeever, 3 miles upstream, is used for power and for the regulation of flow during log driving. Seasonal distribution of flow affected by operation of the State dam at Old Forge. This regulation is indicated by a record from station "Middle Branch of Moose River at Old Forge."

Accuracy.— Stage-discharge relation practically permanent; usually affected by ice for a large part of the period from December to March. Rating curve fairly well defined between 100 and 5,500 second-feet. Gage read to half-tenths twice daily. Daily discharge ascertained by applying mean daily gage height to rating table. Results fairly good except for periods when the discharge is low or the stage-discharge relation is affected by ice for which they are fair.

Discharge measurements of Moose River at Moose River, during the year ending September 30, 1919

DATE	Made by	Gage height	Discharge
		Feet	*Sec.-ft.*
Oct. 17	E D. Burchard	7.35	850
Jan. 8a	do	7.15	603
Feb. 19a	do	6.59	472
July 18	M. H. Carson	5.44	139

a Some backwater due to ice.

Daily discharge, in second-feet, of Moose River at Moose River, for the year ending September 30, 1919

DAY	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1.....	715	2,660	580	760	500	1,020	1,590	1,260	670	259	151	259
2.....	625	1,910	760	965	460	1,140	1,380	1,260	500	189	164	274
3.....	625	1,590	670	965	500	965	1,320	1,670	441	320	151	289
4.....	760	1,450	670	1,020	422	1,080	1,320	1,320	164	151	151	320
5.....	860	1,320	670	715	422	910	1,380	1,450	422	176	151	289
6.....	1,380	1,200	580	600	404	910	910	1,590	500	176	151	259
7.....	2,460	860	625	650	386	965	2,090	1,450	202	230	114	320
8.....	1,750	965	540	700	422	1,020	2,460	1,320	259	202	151	320
9.....	1,670	965	580	650	422	1,080	2,860	1,200	259	176	138	352
10.....	1,140	860	625	650	422	1,200	3,060	1,020	230	230	138	500
11.....	1,020	715	670	650	422	1,590	3,060	1,020	230	230	126	580
12.....	1,020	760	625	600	441	1,260	9,250	1,140	189	500	114	540
13.....	910	760	580	600	422	1,080	3,620	1,020	176	202	103	580
14.....	1,080	760	540	600	500	965	2,960	910	138	202	114	422
15.....	1,080	670	1,080	550	580	715	2,660	860	202	259	114	441
16.....	910	670	1,910	500	625	810	2,360	760	259	304	189	336
17.....	860	404	1,320	480	580	715	2,270	910	352	289	386	320
18.....	810	580	1,140	460	550	1,450	2,270	2,090	352	259	460	369
19.....	715	910	1,020	440	500	2,460	1,910	2,090	304	274	441	404
20.....	760	1,320	860	440	480	2,180	1,450	1,380	259	138	460	369
21.....	1,080	1,080	670	440	420	2,270	1,450	1,260	259	176	386	386
22.....	1,200	965	580	422	400	2,460	1,670	1,080	230	176	441	625
23.....	1,020	860	1,750	422	420	2,000	1,450	1,260	230	176	386	580
24.....	965	625	2,660	1,020	420	2,090	1,320	1,200	189	202	352	625
25.....	860	715	1,670	1,380	420	2,180	1,590	1,080	320	189	386	670
26.....	965	670	1,260	1,450	440	1,750	1,380	1,200	176	176	441	670
27.....	1,140	580	1,260	965	500	2,360	860	1,080	320	151	460	625
28.....	1,140	580	1,020	760	670	2,960	1,140	760	540	274	404	540
29.....	1,020	670	760	760	......	3,060	1,200	715	422	500	320	625
30.....	1,320	860	860	580	......	2,090	1,260	760	189	369	202	540
31.....	2,460	......	810	500	......	1,830	......	860	......	202	230	......

NOTE.— Stage-discharge relation affected by ice January 6–21, and February 18–26. Daily discharge for these periods is approximate.

Monthly discharge of Moose River at Moose River, for the year ending September 30, 1919
[Drainage area, 370 square miles]

MONTH	DISCHARGE IN SECOND-FEET				RUN-OFF
	Maximum	Minimum	Mean	Per square mile	Depth in inches on drainage area
October..........................	2,460	625	1,110	3.00	3.46
November..........................	2,660	404	964	2.61	2.91
December..........................	2,660	540	947	2.56	2.95
January..........................	1,450	422	700	1.89	2.18
February..........................	670	400	470	1.27	1.32
March..........................	3,060	715	1,570	4.24	4.89
April..........................	9,250	860	2,120	5.73	6.39
May..........................	2,090	715	1,190	3.22	3.71
June..........................	670	138	299	.808	.90
July..........................	500	138	237	.641	.74
August..........................	460	103	257	.695	.80
September..........................	670	259	448	1.21	1.35
The year....................	9,250	103	861	2.33	31.60

MIDDLE BRANCH OF MOOSE RIVER AT OLD FORGE

Location.—About 300 feet below highway bridge and 400 feet below State dam at Old Forge, Herkimer County.

Drainage area.— 51.5 square miles (measured on topographic maps).

Records available.— November 9, 1911, to September 30, 1919.

Gage.— Vertical staff on left bank 300 feet below highway bridge; read by Jacob Edick.

Discharge measurements.— Made from highway bridge or by wading near gage.

Channel and control.— Bed near gage composed of stone and gravel. Control is rock ledge about 200 feet below gage, practically permanent.

Extremes of discharge.— Maximum stage recorded during year 4.1 feet at 8 A. M. April 13 (discharge, 557 second-feet); minimum stage recorded 0.98 foot from 8 A. M. August 30, to 8 A. M. September 3 (discharge, 26 second-feet). Minimum stage occurs when the gates of the dam are closed, discharge being due to leakage and discharge through the fish hatchery.

1911–1919: Maximum stage recorded, 6.3 feet March 28, 1913; stage-discharge relation affected by backwater from Moose River; discharge computed from records at dam, 760 second-feet.

Minimum stage recorded, 0.98 foot from 8 A. M. August 30, 1919, to 8 A. M. September 3, 1919 (discharge, 26 second-feet).

Ice.— Stage-discharge relation not affected by ice.

Regulation.— Flow controlled by dam.

Accuracy.— Stage-discharge relation practically permanent between dates of shift; not affected by ice. Rating curve well defined from 20 to 400 second-feet. Gage read to hundredths twice daily. Daily discharge ascertained by applying to rating table mean daily gage height weighted on days of changing gates from records of gate opening at dam. Records good except those computed from gate openings at the dam, which are fair.

Discharge measurements of Middle Branch of Moose River at Old Forge, during the year ending September 30, 1919

DATE	Made by	Gage height	Discharge
		Feet	*Sec.-ft.*
July 19	O. W. Hartwell	1.14	32.1

Daily discharge, in second-feet, of Middle Branch of Moose River at Old Forge, for the year ending September 30, 1919

DAY	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1.....	98	214	116	80	56	70	290	189	31	34	36	26
2.....	98	232	116	80	58	75	280	189	29	32	35	26
3.....	116	232	116	80	60	75	270	189	29	31	34	50
4.....	165	232	116	80	60	75	260	189	29	31	32	65
5.....	181	232	116	80	60	75	260	189	29	31	32	86
6.....	214	232	116	80	60	80	250	189	43	32	33	165
7.....	214	223	116	80	60	86	232	181	40	32	32	158
8.....	241	214	116	80	60	86	220	143	40	31	32	158
9.....	270	214	116	80	60	92	220	65	40	32	33	165
10.....	280	181	116	80	60	110	220	65	40	32	33	173
11.....	260	150	116	60	60	123	220	65	39	33	32	214
12.....	260	150	110	40	60	130	220	49	37	33	32	206
13.....	260	150	98	43	60	130	220	46	36	33	33	197
14.....	250	150	75	45	61	123	220	45	34	33	86	197
15.....	241	150	75	45	63	116	220	40	39	33	197	197
16.....	241	116	75	43	65	104	220	40	39	33	197	197
17.....	241	98	75	43	65	104	220	44	39	33	197	197
18.....	241	104	75	43	65	123	200	49	45	33	197	206
19.....	232	104	75	43	65	130	200	55	48	33	189	206
20.....	232	116	75	43	65	136	200	58	48	33	189	197
21.....	223	123	75	45	65	150	200	54	48	33	181	197
22.....	214	123	75	45	65	165	200	53	45	33	181	189
23.....	206	123	75	45	65	165	200	50	40	33	181	189
24.....	206	116	75	48	65	158	197	48	33	32	181	189
25.....	214	116	80	53	65	158	197	53	32	31	181	189
26.....	214	116	86	53	65	150	197	48	33	31	181	181
27.....	214	116	86	54	65	150	197	50	35	32	130	173
28.....	214	116	86	56	65	150	197	50	39	35	110	165
29.....	214	116	86	56	......	173	197	50	39	38	75	165
30.....	214	116	86	56	......	181	189	48	39	38	26	165
31.....	214	......	80	56	......	260	......	42	......	37	26	......

NOTE.— Stage-discharge relation affected by logs on control April 8 to 23. Daily discharge for this period is approximate.

Monthly discharge of Middle Branch of Moose River at Old Forge, for the year ending September 30, 1919.

[Drainage area, 51.5 square miles]

MONTH	DISCHARGE IN SECOND-FEET				RUN-OFF
	Maximum	Minimum	Mean	Per square mile	Depth in inches on drainage area
October..........................	280	98	216	4.20	4.84
November..........................	232	98	156	3.03	3.38
December..........................	116	75	93.5	1.82	2.10
January..........................	80	40	58.6	1.14	1.31
February..........................	65	56	62.2	1.21	1.26
March..........................	260	70	126	2.45	2.82
April..........................	290	189	220	4.27	4.76
May..........................	189	40	84.7	1.64	1.89
June..........................	48	29	37.9	.736	.82
July..........................	38	31	32.9	.639	.74
August..........................	197	26	101	1.96	2.26
September..........................	214	26	163	3.17	3.54
The year..........................	290	26	113	2.20	29.72

BEAVER RIVER AT STATE DAM NEAR BEAVER RIVER P. O.

Location.—At concrete storage dam at outlet of Beaver River flow, about 7½ miles west of Beaver River postoffice, Herkimer County, and 7 miles above Beaver Lake at Number Four.

Drainage area.— 176 square miles (measured on topographic maps).

Records available.— May 11, 1908, to September 30, 1919.

Gages.— Elevation of water surface in the reservoir is determined by a staff gage in two sections, on the west corner of the gate house, read by James Dunbar, gate tender. The mean elevation of the crest of the spillway is at gage height 16.96 feet. Prior to September 28, 1913, elevation of water surface was determined by measuring the distance from the water surface to a reference point set at the elevation of the crest of the spillway. Widths of sluice gate openings determined by measuring on the gate stems the distance they have been raised.

Discharge measurements.— Current-meter measurements made from a temporary foot-bridge at the mouth of the outlet tunnel, below the gates. Discharge over the spillway has not been measured.

Determination of discharge.— Records include the discharge through one or more of four 4-foot circular sluice gates, when opened, the discharge over the spillway, and the discharge through the logway at the west end of the spillway. The sluice gates have been rated by current-meter measurements made at different lake elevations but no measurements have been made of the discharge over the spillway or through the logway. Theoretic coefficients based on the Cornell experiments[a] have been used to compute ratings for the spillway and logway.

Regulation.—At ordinary stages the discharge of Beaver River is completely regulated by the operation of the sluice gates.

Extremes of stage.— Maximum elevation of water surface in reservoir recorded during year, 18.9 feet at 7:15 A. M. April 12; minimum stage recorded 7.0 feet at 4:05 P. M. September 19.

1908–1919: Maximum elevation of water surface in reservoir 19.46 feet March 29, 1913; minimum stage, 2.9 feet September 29 and October 1, 1913.

Extremes of discharge.— Maximum daily discharge during year, 2,700 second-feet April 12; minimum discharge, about 4 second-feet March 22, when gates were closed.

1908–1919: Maximum discharge, 3,296 second-feet on May 2, 1911. Minimum discharge, zero, during periods when gates were closed and there was no flow over spillway.

Accuracy.— Stage-discharge relation permanent; probably not affected by ice. Rating curves for sluice gates well defined. Lake gage read to half-tenths once daily. The accuracy of computations depends to a large extent on the care with which the gates were set to the recorded openings. Records fair.

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[a] U. S. Geological Survey Water-Supply Paper 200.

Daily discharge, in second-feet, of Beaver River at State Dam near Beaver River, for the year ending September 30, 1919.

DAY	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1	222	463	366	394	252	297	646	535	280	245	218	180
2	222	809	366	429	251	297	552	535	280	244	218	178
3	224	809	366	463	250	297	552	535	244	243	216	176
4	225	714	338	429	250	297	854	630	207	242	214	176
5	226	624	338	429	250	298	959	728	207	241	212	174
6	228	624	293	429	250	298	553	728	207	240	212	174
7	235	536	293	366	249	298	917	679	207	240	211	169
8	238	536	293	315	249	298	1,260	679	173	239	210	167
9	241	463	293	315	249	298	1,270	630	173	237	207	167
10	241	429	293	315	248	299	1,140	582	139	236	205	168
11	241	394	293	279	248	302	1,710	535	139	235	202	169
12	242	338	265	265	265	303	2,700	535	192	235	201	173
13	244	315	265	262	309	303	2,410	535	265	234	199	174
14	245	293	265	259	309	304	1,730	535	257	233	198	172
15	245	293	338	257	309	304	1,390	490	257	233	194	169
16	245	293	463	257	309	304	1,330	427	256	232	192	164
17	246	293	580	256	308	304	1,210	368	257	231	190	159
18	246	338	536	254	307	307	1,210	552	257	230	189	154
19	246	500	463	254	307	311	1,090	835	254	229	189	149
20	247	714	394	254	306	314	846	777	252	228	187	151
21	247	714	366	253	305	183	807	650	251	227	187	155
22	248	624	394	252	304	4	807	601	250	226	186	159
23	249	536	463	252	303	334	709	552	250	226	184	163
24	249	500	624	252	303	503	709	552	249	224	184	164
25	250	394	714	252	302	433	709	504	248	223	184	163
26	250	366	714	252	301	642	709	504	248	222	184	163
27	251	338	624	252	299	749	661	457	248	222	184	163
28	251	338	536	252	298	1,110	584	412	248	222	184	163
29	252	338	536	252	......	1,110	535	412	248	222	183	164
30	257	338	463	252	......	990	535	324	246	221	181	165
31	265	......	394	252	......	855	......	280	......	220	181	......

Monthly discharge of Beaver River at State Dam near Beaver River, for the year ending September 30, 1919

[Drainage area, 176 square miles]

MONTH	DISCHARGE IN SECOND-FEET				RUN-OFF
	Maximum	Minimum	Mean	Per square mile	Depth in inches on drainage area
October	265	222	242	1.38	1.59
November	809	293	475	2.70	3.01
December	714	265	417	2.37	2.73
January	463	252	299	1.70	1.96
February	309	248	282	1.60	1.67
March	1,110	4	418	2.38	2.74
April	2,700	535	1,040	5.91	6.59
May	835	280	552	3.14	3.62
June	280	139	233	1.32	1.47
July	245	220	232	1.32	1.52
August	218	181	196	1.11	1.28
September	180	149	166	.943	1.05
The year	2,700	4	379	2.16	29.23

OSWEGATCHIE RIVER NEAR HEUVELTON

Location.— 2½ miles above Heuvelton, St. Lawrence county, 3 miles below Rensselaer Falls, and 7 miles above mouth of Indian River (outlet to Black Lake).

Drainage Area.— 961 square miles (measured on topographic maps).

Records Available.— June 23, 1916, to September 30, 1919.

Gage.— Gurley seven-day graph water-stage recorder on the right bank, about 2½ miles above Heuvelton, installed September 16, 1916. Prior to this date gage height was determined by measuring the distance from a reference point to the water surface. Recorder inspected by George Todd.

Channel and control.— Solid rock.

Extremes of discharge.— Maximum stage, from water-stage recorder, during year 5.94 feet at 1:30 A. M. March 21, (discharge 7,760 second-feet); minimum stage from water-stage recorder, 1.07 feet at 7 P. M., August 15 (discharge 404 second-feet).

1916–1919: Maximum stage from water-stage recorder 7.6 feet from 9 A. M. to 12 A. M., March 30, 1917 (discharge 11,700 second-feet); minimum stage from water-stage recorder 0.91 foot at 11 P. M., October 16, 1916 (discharge 320 second-feet).

Ice.— Stage-discharge relation slightly affected by ice.

Regulation.— Some diurnal fluctuation due to operation of mills at Rensselaer Falls and above. Seasonal flow regulated by storage in Cranberry Lake.

Accuracy.— Stage-discharge relation permanent. Rating curve well defined between 400 and 15,000 second-feet. Stage discharge relation usually affected by ice during a portion of the period from January to March. The operation of water-stage recorder satisfactory during the year. Daily discharge ascertained by applying mean daily gage height to rating table. Open-water records good, winter records fair.

Discharge measurements of Oswegatchie River near Heuvelton, during the year ending September 30, 1919.

DATE	Made by	Gage height	Discharge
		Feet	*Sec-ft.*
Feb. 18	E. D. Burchard	2.13	1,320
June 12	C. C. Covert	1.63	846

Daily discharge, in second-feet, of Oswegatchie River near Heuvelton, for the year ending September 30, 1919.

DAY	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1.....	1,370	3,530	2,460	2,820	1,460	1,520	2,250	2,820	1,300	2,750	694	570
2.....	1,260	3,530	2,320	2,820	1,120	2,180	2,530	3,050	1,160	1,980	646	555
3.....	1,190	3,370	2,250	2,820	947	2,460	2,600	3,130	1,070	1,510	646	630
4.....	1,080	2,900	2,180	2,980	956	2,600	2,600	3,050	947	1,210	615	615
5.....	1,100	2,600	1,910	3,050	966	2,900	2,980	3,870	909	1,000	570	585
6.....	2,690	2,390	1,550	2,460	976	2,750	3,620	4,830	863	918	578	541
7.....	5,100	2,110	1,720	2,040	947	2,390	4,470	4,920	1,090	818	570	541
8.....	6,050	1,980	1,720	1,750	836	2,110	5,290	4,650	1,490	702	555	541
9.....	6,050	1,840	1,800	1,720	719	1,910	5,480	4,040	1,120	662	541	710
10.....	5,100	1,650	1,900	2,040	686	2,320	5,670	3,450	1,110	615	499	827
11.....	4,120	1,590	1,800	1,980	755	3,210	5,860	2,980	966	600	485	872
12.....	3,290	1,510	1,780	1,780	686	3,370	6,450	2,750	827	592	433	985
13.....	2,600	1,390	1,780	1,410	622	3,050	7,050	2,600	755	562	452	1,180
14.....	2,110	1,370	2,580	1,200	740	2,750	7,470	2,460	654	578	452	1,280
15.....	1,910	1,310	4,720	1,260	1,850	2,600	7,260	2,180	638	670	446	1,210
16.....	1,730	1,230	6,050	1,290	2,040	2,180	7,050	2,040	622	686	466	1,020
17.....	1,540	1,190	6,250	1,270	1,510	3,730	6,850	1,910	646	728	485	863
18.....	1,430	1,630	5,860	1,270	1,300	6,250	7,050	2,110	670	845	485	818
19.....	1,320	3,390	4,740	1,260	1,200	7,260	6,450	2,320	615	854	472	737
20.....	1,290	4,920	3,780	1,100	1,100	7,470	5,480	2,320	570	755	513	728
21.....	1,410	5,670	3,050	1,020	985	7,260	4,650	2,390	592	654	513	719
22.....	1,680	5,860	2,600	1,080	938	5,860	4,040	2,750	600	686	478	694
23.....	1,910	5,670	2,980	1,090	890	4,830	3,370	2,750	555	678	472	719
24.....	1,840	4,830	3,210	1,750	1,190	3,960	2,900	2,980	527	746	555	818
25.....	1,750	3,960	2,980	2,460	1,280	3,210	2,600	2,750	562	872	694	1,000
26.....	1,780	3,130	2,750	2,250	1,270	2,820	2,460	2,530	600	791	773	928
27.....	2,180	2,600	2,680	2,040	1,220	2,600	2,390	2,390	4,120	773	694	791
28.....	2,460	2,180	2,180	1,980	1,070	2,600	2,250	2,180	5,670	670	662	755
29.....	2,320	2,180	2,180	1,780	......	2,600	2,390	1,910	5,100	686	670	694
30.....	2,180	2,460	2,110	1,630	......	2,250	2,680	1,660	3,870	694	640	662
31.....	2,680	......	2,600	1,460	......	2,040	......	1,470	......	702	630	......

NOTE.— Discharge estimated January 1–3, by comparing with hydrograph of sum of East Branch Oswegatchie, Newton Falls, and West Branch at Harrisville.

Monthly discharge of Oswegatchie River near Heuvelton, for the year ending September 30, 1919
[Drainage area, 961 square miles]

MONTH	DISCHARGE IN SECOND-FEET				RUN-OFF.
	Maximum	Minimum	Mean	Per square mile	Depth in inches on drainage area
October	6,050	1,080	2,400	2.50	2.88
November	5,860	1,190	2,800	2.91	3.25
December	6,250	1,550	2,850	2.97	3.42
January	3,050	1,020	1,830	1.90	2.19
February	2,040	622	1,080	1.12	1.17
March	7,470	1,520	3,390	3.53	4.07
April	7,470	2,250	4,470	4.65	5.19
May	4,920	1,470	2,810	2.92	3.37
June	5,670	527	1,340	1.39	1.55
July	2,750	562	871	.906	1.04
August	773	433	561	.584	.67
September	1,280	541	786	.818	.91
The year	7,470	433	2,110	2.20	29.71

EAST BRANCH OF OSWEGATCHIE RIVER AT NEWTON FALLS

Location.— 600 feet below lower dam of Newton Falls Paper Co., in Newton Falls, St. Lawrence county, 4 miles above mouth of Little River and 10 miles below outlet of Cranberry Lake.

Drainage area.— 166 square miles (measured by engineers of New York Conservation Commission).

Records available.— October 6, 1912, to September 30, 1919.

Gage.— Vertical staff on left bank 600 feet below lower dam; read by Henry Van Waldick.

Discharge measurements.— Made by wading, or from cable 30 feet upstream from gage.

Channel and control.— Small boulders and rock; covered with waste from pulp mill; practically permanent.

Extremes of discharge.— Maximum stage recorded during year, 5.23 feet at 6.20 P. M., April 13 (discharge, 1,630 second-feet); minimum stage is reached nearly every Sunday during low-water period when paper mills shut down.

1912–1919: Maximum stage recorded, 6.1 feet at 5.15 P. M., March 28, 1913 (discharge, 2,200 second-feet).

Ice.— Stage-discharge relation affected by ice only for a short time during extremely cold weather.

Regulation.— Some diurnal fluctuation in flow caused by operation of paper mills. Seasonal flow largely controlled by storage at Cranberry Lake.

Accuracy.— Stage-discharge relation practically permanent, not affected by ice during year. Rating curve well defined between 20 and 1,200 second-feet. Gage read to hundredths twice daily. Daily discharge ascertained by applying to the rating table weighted mean gage height based on observer's notes concerning operation of paper mills. Records good.

Discharge measurements of East Branch of Oswegatchie River at Newton Falls, during the year ending September 30, 1919.

DATE	Made by	Gage height	Discharge
		Feet	*Sec.-ft.*
June 9........	M. H. Carson....................................	1.71	252

Daily discharge, in second-feet, of East Branch of Oswegatchie River at Newton Falls, for the year ending September 30, 1919.

DAY	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1.....	445	338	282	490	315	272	810	588	252	315	338	338
2.....	430	376	430	475	293	272	770	571	144	293	293	402
3.....	460	282	315	460	554	350	894	538	293	315	40	315
4.....	282	402	460	445	304	338	982	350	293	50	293	402
5.....	475	389	460	282	363	350	938	658	326	50	376	350
6.....	852	402	282	445	252	326	658	658	304	60	363	304
7.....	770	430	402	506	293	350	810	694	293	402	315	40
8.....	658	304	57	460	272	293	810	694	272	326	326	326
9.....	506	326	416	460	293	293	810	732	242	262	460	363
10.....	326	57	430	460	315	389	982	658	272	293	50	445
11.....	293	272	460	522	338	363	1,170	658	293	272	430	402
12.....	252	293	430	252	315	338	1,330	252	315	326	363	376
13.....	315	326	430	538	326	326	1,500	475	326	304	304	363
14.....	326	315	460	363	363	272	1,440	460	272	326	160	40
15.....	338	282	202	363	315	315	1,330	538	103	293	416	588
16.....	363	315	658	445	282	252	1,270	506	272	262	376	350
17.....	252	137	538	445	350	376	1,220	522	416	402	85	326
18.....	272	338	506	252	304	363	1,070	490	293	363	293	376
19.....	282	554	571	338	252	430	1,070	658	262	402	326	326
20.....	338	658	445	430	262	338	938	506	272	60	350	282
21.....	475	571	445	445	262	350	852	402	293	260	363	40
22.....	402	506	57	363	252	272	694	522	232	293	389	376
23.....	445	430	622	376	315	293	588	506	130	376	445	490
24.....	338	262	588	252	304	363	588	658	304	350	80	40
25.....	416	588	588	445	389	293	571	460	326	376	363	252
26.....	363	475	658	338	315	293	588	571	363	338	416	252
27.....	326	419	571	460	272	272	554	554	522	50	350	40
28.....	338	460	622	389	252	242	622	430	460	430	376	40
29.....	338	460	538	402	......	262	522	460	363	460	293	40
30.....	376	490	694	430	......	137	554	416	326	363	293	40
31.....	282	......	506	315	......	810	......	363	......	350	80	......

NOTE.— Discharge estimated July 4–6, 20–21, 27, August 3, 10, 14, 24, 31, September 7, 14, 21, 24, 27–30. Water shut off at Cranberry Lake during repairs to dam from September 27 to 30. Discharge estimated by comparing with hydrographs of West Branch Oswegatchie, Harrisville, and Oswegatchie, Heuvelton.

Monthly discharge of East Branch of Oswegatchie River, at Newton Falls, for the year ending September 30, 1919.

[Drainage area, 166 square miles]

MONTH	DISCHARGE IN SECOND-FEET				RUN-OFF
	Maximum	Minimum	Mean	Per square mile	Depth in inches on drainage area
October........................	852	252	398	2.40	2.77
November........................	658	57	382	2.30	2.57
December........................	694	57	456	2.75	3.17
January........................	538	252	408	2.46	2.84
February........................	554	252	312	1.88	1.96
March........................	810	137	329	1.98	2.28
April........................	1,500	522	898	5.41	6.04
May........................	732	252	534	3.22	3.71
June........................	522	103	294	1.77	1.98
July........................	460	50	291	1.75	2.02
August........................	460	40	303	1.83	2.11
September........................	588	40	277	1.67	1.86
The year....................	1,500	40	407	2.45	33.31

WEST BRANCH OF OSWEGATCHIE RIVER NEAR HARRISVILLE

Location.— At highway bridge near Geers Corners, 2½ miles downstream from Harrisville, Lewis county.

Drainage area.— 245 square miles (measured on toographic maps, and of New York issued by U. S. Geol. Survey; scale 1:500,000).

Records available.— July 1, 1916, to September 30, 1919.

Gage.— Vertical staff in three sections on the right bank; section graduated from 0.0 to 3.3 feet about 25 feet below bridge, and two sections graduated from 3.3 to 10.1 feet, on downstream side of bridge abutment. Gage read by Frank Osborne.

Discharge measurements.— Made from cable 200 feet upstream from bridge, or by wading.

Channel and control.— Rocky and rough; probably permanent.

Extremes of discharge.— Maximum stage recorded during year, 6.85 feet at 8 A. M., April 13, (discharge, 3,360 second-feet); minimum stage recorded, 1.4 feet at 7 A.M., August 8 and 15, (discharge, 68 second-feet).

1916–1919: Maximum stage recorded, 8.1 feet at 6.30 A. M. and 6 P. M., March 28, 1917 (discharge 4,880 second-feet); minimum stage recorded, 1.1 feet at 6 P. M.. August 11, 1917, and 7 A. M., August 28 and 29, 1918, (discharge 42 second-feet).

Ice.— Stage-discharge relation probably not affected by ice.

Regulation.— Operation of pulp mill at Harrisville causes some diurnal fluctuation.

Accuracy.— Stage-discharge relation practically permanent; not affected by ice. Rating curve well defined between 50 and 4,000 second-feet. Gage read to one-half tenths twice daily. Daily discharge ascertained by applying mean daily gage height to rating table. Records good.

Discharge measurements of West Branch of Oswegatchie River, near Harrisville, during the yea ending September 30, 1919.

DATE	Made by	Gage height	Discharge
		Feet	*Sec.-ft.*
June 9	M. H. Carson	2.04	175

Daily discharge, in second-feet, of West Branch of Oswegatchie River near Harrisville, for the year ending September 30, 1919.

DAY	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1.....	422	1,350	650	370	388	440	750	850	335	260	158	98
2.....	405	1,210	560	480	275	700	700	850	275	208	135	106
3.....	305	1,090	520	560	275	700	600	850	275	220	146	106
4.....	305	910	560	560	245	650	650	850	232	124	106	124
5.....	305	750	520	600	305	650	750	970	220	124	106	124
6.....	700	700	520	560	245	650	910	1,210	220	98	91	91
7.....	2,220	560	480	480	220	700	1,210	1,210	170	91	91	98
8.....	2,040	480	460	440	220	600	1,800	1,090	220	74	91	106
9.....	1,560	480	460	405	208	600	2,130	910	182	91	91	146
10.....	1,280	480	520	335	195	800	1,880	750	158	106	98	275
11.....	970	422	480	305	182	850	1,800	700	170	124	91	275
12.....	650	480	440	370	170	910	2,690	700	170	195	79	320
13.....	480	405	440	275	182	800	3,090	650	170	170	79	480
14.....	520	388	600	320	220	850	2,400	650	146	124	85	405
15.....	520	370	1,490	305	370	750	1,960	560	146	124	79	320
16.....	405	335	2,310	305	370	650	1,640	480	106	170	85	275
17.....	405	335	1,880	290	335	970	1,420	480	158	220	106	208
18.....	388	910	1,490	275	320	1,640	1,280	600	182	195	124	208
19.....	305	1,960	1,090	305	305	2,400	1,090	700	135	170	245	245
20.....	275	2,890	850	290	245	2,040	970	650	115	135	146	232
21.....	460	2,490	750	245	275	1,640	910	650	106	115	158	305
22.....	700	1,960	600	245	245	1,350	850	600	146	245	170	305
23.....	650	1,560	750	275	232	1,210	750	560	170	440	245	405
24.....	600	1,150	850	560	245	1,030	650	520	195	320	182	520
25.....	560	910	910	750	245	850	650	440	232	195	245	370
26.....	650	700	850	600	232	800	600	480	158	170	158	335
27.....	850	520	800	520	260	750	600	560	650	245	146	275
28.....	910	480	700	480	220	700	600	520	750	305	146	220
29.....	850	560	600	440	......	650	750	422	560	195	115	195
30.....	910	700	480	405	......	650	850	370	405	182	170	195
31.....	1,150	......	405	352	......	750	......	370	......	170	124	.....

NOTE.—Stage-discharge relation not affected by ice.

Monthly discharge of West Branch of Oswegatchie River, near Harrisville, for the year ending Sept. 30, 1919
[Drainage area, 245 square miles]

MONTH	DISCHARGE IN SECOND-FEET				RUN-OFF
	Maximum	Minimum	Mean	Per square mile	Depth in inches on drainage area
October	2,220	275	734	3.00	3.46
November	2,890	335	918	3.75	4.18
December	2,310	405	775	3.16	3.64
January	750	245	409	1.67	1.92
February	388	170	258	1.05	1.09
March	2,400	440	927	3.78	4.36
April	3,090	600	1,230	5.02	5.60
May	1,210	370	684	2.79	3.22
June	750	106	239	.98	1.09
July	440	74	181	.739	.85
August	245	79	132	.539	.62
September	520	91	246	1.00	1.12
The year	3,090	74	563	2.30	31.15

RAQUETTE RIVER AT PIERCEFIELD

Location.— Half a mile below dam of International Paper Co. at Piercefield, St. Lawrence county, and about three-fourths mile above head of Black Rapids.

Drainage area.— 723 square miles (all but 16 square miles measured on topographic maps).

Records available.— August 20, 1908, to September 30, 1919.

Gage.— Stevens water-stage recorder in a galvanized sheet-iron house over a concrete well on left bank about one-half mile below dam. Recorder inspected by M. O. Wood.

Discharge measurements.— Made from a cable three-fourths mile below gage, just above Black Rapids.

Channel and control.— Channel opposite gage is a deep pond with no perceptible velocity. Control is at head of Black Rapids.

Extremes of discharge.— Maximum stage recorded during year 9.93 feet at 9 P. M. April 16 (discharge, 5,170 second-feet); minimum stage recorded, 1.62 feet from 6 A. M. to 3 P. M. September 7 (discharge, 43 second-feet).

1908–1919: Maximum stage from water-stage recorder, 11.68 feet at 3 A. M. April 1, 1913 (discharge, 7,100 second-feet); minimum stage from water-stage recorder, 0.85 foot at 11 A. M. September 2, 1913 (discharge, about 10 second-feet).

Ice.— Rapids that form control rarely freeze; measurements made when the pond was covered with ice indicate that the stage-discharge relation was not affected.

Regulation.— Large diurnal fluctuation in flow caused by operation of dam during low and medium stages. Numerous lakes in upper part of drainage basin afford considerable storage, most of which is so controlled, that the effect on the seasonal distribution of flow is large.

Accuracy.— Stage-discharge relation practically permanent; not affected by ice. Rating curve well defined between 50 and 7,000 second-feet. Operation of water stage recorder satisfactory throughout the year. Daily discharge ascertained by use of discharge integrator. Records good.

Cooperation.— Water-stage recorder inspected by an employee of the International Paper Co.

Daily discharge, in second-feet, of Raquette River at Piercefield, for the year ending September 30, 1919

DAY	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1......	1,280	2,410	1,550	1,690	1,010	620	2,300	3,440	1,910	845	464	78
2......	1,260	2,780	1,920	1,690	409	306	2,380	3,300	2,080	623	463	296
3......	1,240	2,680	1,800	1,690	575	734	2,480	3,160	1,940	855	240	434
4......	1,190	2,980	1,720	1,660	890	903	2,500	3,290	1,890	294	320	390
5......	1,160	2,880	1,590	1,210	900	580	2,520	3,400	1,810	184	479	255
6......	1,440	2,880	1,510	1,560	918	683	2,310	3,340	1,700	194	462	91
7......	2,180	2,780	1,590	1,560	895	800	2,700	3,560	1,590	518	446	50
8......	2,500	2,590	1,150	1,490	800	791	2,840	3,410	1,260	643	451	305
9......	2,780	2,500	1,520	1,510	327	411	3,060	3,300	1,510	609	427	509
10......	2,900	2,240	1,490	1,490	392	737	3,400	3,240	1,320	615	129	530
11......	2,900	2,410	1,420	1,380	580	990	3,610	2,890	1,210	604	425	515
12......	2,770	2,410	1,390	650	580	868	3,990	2,940	1,200	495	442	369
13......	2,510	2,240	1,360	1,100	545	925	4,300	2,820	1,190	219	405	512
14......	2,590	2,150	1,360	1,310	598	963	4,600	2,750	1,130	444	240	282
15......	2,430	2,070	896	1,280	750	975	4,900	2,800	563	604	225	384
16......	2,270	1,990	1,390	1,230	416	567	5,010	2,760	854	576	185	562
17......	2,170	1,570	1,460	1,200	648	923	5,030	2,790	937	599	195	586
18......	2,080	1,900	1,490	1,280	755	1,160	5,090	2,710	960	595	436	560
19......	1,940	2,070	1,490	1,240	780	1,230	5,010	2,710	938	587	425	568
20......	1,820	2,070	1,460	545	680	1,250	5,020	2,680	870	305	287	555
21......	1,860	2,150	1,420	720	560	1,430	4,910	2,670	600	396	289	261
22......	1,840	2,240	960	690	560	1,580	4,820	2,650	278	597	225	412
23......	1,760	2,320	1,490	880	303	1,420	4,670	2,650	452	573	125	579
24......	1,760	1,990	1,440	1,160	600	1,820	4,560	2,610	652	575	73	573
25......	1,660	2,240	1,360	1,180	820	1,950	4,290	2,570	622	575	342	575
26......	1,660	2,240	1,800	1,140	640	2,020	4,180	2,680	624	463	395	599
27......	1,590	2,070	1,870	520	598	2,070	4,030	2,590	665	222	424	608
28......	1,720	1,720	1,840	927	627	2,210	3,900	2,530	556	384	333	318
29......	1,720	2,030	1,460	940	......	2,220	3,760	2,420	256	579	222	474
30......	1,870	1,990	1,840	1,100	......	1,980	3,610	2,320	600	520	284	592
31......	2,070	......	1,760	990	......	2,240	......	2,220	......	460	150	......

NOTE.— Daily discharge estimated because of no gage height record Jan. 12 and 13.

Monthly discharge of Raquette River at Piercefield, for the year ending September 30, 1919
[Drainage area, 723 square miles]

MONTH	DISCHARGE IN SECOND-FEET				RUN-OFF
	Maximum	Minimum	Mean	Per square mile	Depth in inches on drainage area
October	2,900	1,160	1,970	2.72	3.14
November	2,980	1,570	2,290	3.17	3.54
December	1,920	896	1,510	2.09	2.41
January	1,690	520	1,190	1.60	1.84
February	1,010	303	648	.896	.93
March	2,240	306	1,210	1.67	1.92
April	5,090	2,300	3,860	5.34	5.96
May	3,560	2,220	2,880	3.98	4.59
June	2,080	256	1,070	1.48	1.65
July	845	184	506	.700	.81
August	479	73	323	.447	.52
September	608	47	422	.584	.65
The year	5,090	47	1,490	2.06	27.96

ST. REGIS RIVER AT BRASHER CENTER

Location.— Near steel highway bridge in Brasher Center, St. Lawrence County, 5 miles downstream from Brasher Falls, 6¼ miles below junction of East and West branches of St. Regis River and about 12 miles above mouth.

Drainage area.— 621 square miles (measured on post route map).

Records available.—August 22, 1910, to September 30, 1919.

Gages.— Staff, with inclined and vertical sections, on right bank about 600 feet above bridge; installed June 24, 1916. Gage read by George Myers and Henry Shattuck.

Discharge measurements.— Made from a cable at the staff gage, installed in June, 1916. Previously made from the highway bridge, or by wading.

Channel and control.— Bed at cable composed of small boulders and coarse gravel; fairly permanent.

Extremes of discharge.— Maximum stage recorded during year, 9.5 feet at 5 P. M. March 18 (discharge, 5,850 second-feet); minimum stage recorded, 5.88 several times during August (discharge, 206 second-feet).

1910–1919: Maximum stage recorded, 9.1 feet at 7 A. M. March 27, 1914 (discharge, 16,200 second-feet); minimum stage recorded, 5.25 feet at 5 P. M. August 8, 1917 (discharge, about 34 second-feet).

Ice.— Stage-discharge relation affected by ice.

Accuracy.— Stage-discharge relation practically permanent, except as usually affected by ice December to March. Rating curves well defined between 200 and 6,000 second-feet. Gage read to quarter-tenths twice daily. Daily discharge, except for period of ice effect, ascertained by applying mean daily gage height to rating table. Open-water records good; winter records fair.

Discharge measurements of St. Regis River at Brasher Center, during the year ending September 30, 1919

DATE	Made by	Gage height	Discharge
		Feet	*Sec.-ft.*
Jan. 9*a*	E. D. Burchard	7.83	709
Feb. 17*a*	do	7.10	769
Mar. 8*a*	do	7.28	1,250
June 11	M. H. Carson	6.32	532

a Backwater present, due to ice.

Daily discharge, in second-feet, of St. Regis River at Brasher Center, for the year ending September 30, 1919

DAY	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1	1,800	480	550	2,030	2,030	758	705	305	429
2	1,800	420	1,100	1,880	1,960	705	510	284	438
3	1,800	440	1,400	1,800	1,880	625	412	270	372
4	1,800	500	1,500	1,730	1,590	520	348	248	340
5	1,700	600	1,500	1,730	2,830	420	348	248	312
6	1,800	500	1,500	1,880	3,350	438	*a*	248	326
7	1,800	500	1,500	3,530	3,000	465	*a*	248	312
8	2,000	480	1,400	3,920	2,500	429	*a*	237	340
9	700	460	1,300	3,720	2,030	548	*a*	242	705
10	650	400	1,700	3,530	1,730	510	*a*	220	1,240
11	650	340	2,000	3,720	1,880	520	*a*	237	1,180
12	600	380	1,800	4,960	1,800	492	*a*	215	1,050
13	600	400	1,700	4,540	1,800	510	*a*	237	930
14	600	480	1,200	3,920	1,380	548	*a*	215	870
15	800	650	1,100	3,170	1,660	520	*a*	220	758
16	1,000	900	1,100	3,000	1,180	586	*a*	215	655
17	900	750	1,800	3,720	1,120	567	*a*	210	615
18	800	800	3,400	3,170	1,450	695	*a*	210	529
19	900	750	3,530	2,830	1,660	645	*a*	226	474
20	750	550	3,350	2,500	1,310	596	*a*	248	429
21	600	550	3,350	2,030	1,240	474	*a*	248	456
22	500	550	3,000	1,800	1,180	429	*a*	277	501
23	600	500	2,830	1,960	1,520	412	*a*	388	501
24	1,100	600	2,660	1,880	2,030	348	*a*	492	456
25	1,000	500	2,340	1,520	1,800	340	*a*	596	492
26	1,200	500	2,500	1,590	1,880	388	*a*	665	567
27	1,100	460	2,340	1,450	1,660	1,310	*a*	615	586
28	850	480	2,500	1,590	1,450	1,800	*a*	615	520
29	750	......	1,590	2,180	1,120	1,450	*a*	520	456
30	650	......	1,800	2,180	870	930	*a*	474	388
31	600	......	1,800	......	758	......	*a*	438	......

Note.— Stage-discharge relation affected by ice, Jan. 1, to March 18.
a Estimated at 383 second-feet.

Monthly discharge of St. Regis River at Brasher Center, for the year ending September 30, 1919
[Drainage area, 621 square miles]

MONTH	Discharge in Second-feet				Run-off
	Maximum	Minimum	Mean	Per square mile	Depth in inches on drainage area
January	2,000	500	1,050	1.69	1.95
February	900	340	533	.858	.89
March	3,530	550	1,970	3.17	3.66
April	4,960	1,450	2,650	4.27	4.76
May	3,350	758	1,730	2.79	3.22
June	1,800	340	633	1.02	1.14
July	....	....	396	.638	.74
August	665	210	326	.525	.61
September	1,240	312	574	.924	1.03

RICHELIEU RIVER AT FORT MONTGOMERY, ROUSES POINT, N. Y.

Location.— Inside the fort, three-eighths mile south of international boundary, about half a mile above head of Richelieu River, the outlet of Lake Champlain, and one mile northeast of Rouses Point, Clinton County.

Drainage area.— 7,870 square miles, including 436 square miles of water surface (from annual report of New York State Engineer and Surveyor).

Records available.— 1875 to 1919.

Gage.— Staff, inside of fort; read by Thomas Bourke. Elevation of gage zero, 92.50 feet above mean sea level.

Extremes of stage.— Maximum elevation recorded during year, 99.15 feet at 10 A. M. April 20; minimum elevation recorded, 93.20 feet at 10 A. M. September 8.

1869–1919: Maximum elevation recorded, 103.28 feet April, 1869;* minimum elevation recorded, 91.9 feet November 13, 1908.

Cooperation.— Gage heights observed under direction of the Corps of Engineers of the United States Army and reported weekly to the United States Geological Survey.

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* Hoyt, J. C. Stream measurements, 1903, North Atlantic, St. Lawrence River and Great Lakes drainage; U. S. Geol. Survey Water-Supply Paper 97, p. 340, 1904.

Daily gage height, in feet of Richelieu River at Fort Montgomery, N. Y., for the year ending September 30, 1919

DAY	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1.....	2.35	4.35	4.35	3.85	3.15	2.15	4.35	5.50	4.60	2.78	1.55	.85
2.....	2.60	4.55	4.40	3.80	3.10	2.30	4.40	5.58	4.57	2.72	1.47	.82
3.....	2.40	4.60	4.35	3.85	3.05	2.30	4.45	5.37	4.44	2.67	1.43	.83
4.....	2.45	4.60	4.25	3.85	3.00	2.45	4.40	5.30	4.35	2.63	1.42	.82
5.....	2.60	4.55	4.20	3.85	2.95	2.40	4.40	5.30	4.30	2.55	1.40	.92
6......	2.90	4.60	4.10	3.85	2.95	2.50	4.45	5.30	4.25	2.43	1.43	.90
7......	3.30	5.00	4.45	3.90	2.90	2.55	4.60	5.70	4.10	2.38	1.42	.78
8......	3.60	4.40	4.20	3.90	2.85	2.55	4.80	5.20	4.18	2.32	1.23	.70
9.....	3.85	5.40	4.00	3.90	2.80	2.65	4.95	5.23	4.22	2.42	1.24	.89
10......	3.90	4.30	3.85	3.85	2.75	2.70	5.50	5.20	4.05	2.57	1.29	.80
11.....	3.90	4.25	4.15	3.80	2.70	2.70	5.30	5.15	3.90	2.25	1.23	.84
12.....	3.90	4.25	4.30	3.70	2.65	2.75	5.55	5.05	3.95	2.15	1.20	.75
13.....	4.05	4.55	3.80	3.65	2.60	2.80	6.05	5.05	3.85	2.10	1.18	.87
14.....	3.80	4.10	4.05	3.60	2.60	2.80	6.20	5.00	3.82	2.08	1.17	.98
15.....	3.70	4.15	3.75	3.50	2.55	2.80	6.30	4.88	3.75	2.25	1.10	1.05
16.....	3.75	3.95	3.95	3.50	2.50	2.90	6.40	4.86	3.67	2.05	1.10	1.19
17.....	3.65	3.95	3.80	3.45	2.45	2.90	6.45	4.85	3.60	2.12	1.15	1.03
18.....	3.55	3.90	3.95	3.40	2.40	3.00	6.40	4.73	3.53	2.07	1.12	1.20
19.....	3.60	4.25	3.95	3.35	2.40	3.05	6.40	4.75	3.57	1.95	1.18	1.38
20.....	4.25	4.60	4.05	3.30	2.35	3.15	6.65	4.72	3.50	1.91	1.05	1.15
21.....	3.65	4.85	3.85	3.20	2.35	3.25	6.20	4.65	3.38	1.95	1.08	1.22
22.....	3.55	4.85	4.15	3.25	2.30	3.30	6.30	4.60	3.25	2.00	1.00	1.27
23.....	3.60	4.90	3.80	3.20	2.30	3.45	6.25	4.87	3.32	1.87	.95	1.03
24.....	3.60	4.95	3.80	3.15	2.20	3.50	6.20	4.92	3.20	1.95	1.03	1.20
25.....	3.75	4.85	3.95	3.20	2.25	3.70	6.00	4.93	3.08	1.80	.92	1.40
26.....	3.60	4.65	4.00	3.25	2.15	3.80	6.05	4.92	3.12	1.86	.95	1.00
27.....	3.65	4.60	3.95	3.25	2.10	3.85	5.85	4.88	2.94	1.85	.93	1.10
28.....	3.80	4.70	3.85	3.20	2.10	3.90	5.80	4.88	2.87	1.72	.93	1.14
29.....	3.65	4.60	3.90	3.20	......	3.95	5.55	4.84	2.83	1.63	.92	1.18
30.....	3.70	4.60	3.90	3.15	......	4.20	5.50	4.67	2.82	1.57	.98	.95
31.....	4.10	......	3.85	3.15	......	4.30	......	4.65	......	1.62	.88	......

LAKE GEORGE AT GLEN ISLAND.

Location.— On dock on northeast side of Glen Island about 2 miles northeast of Bolton Landing. Reached by boat from Bolton Landing.

Drainage area.— Not measured.

Records available.— September 4, 1919, to September 30, 1919.

Gage.— Vertical cast iron staff gage, reading from 6.0 to 10.0 feet fastened to 2-inch by 8-inch oak plank. Gage read twice daily to quarter-tenths by Jay Taylor, Ranger.

Extremes of stage.— Maximum stage recorded during year, 7.75 feet September 5, 11 and 12; minimum stage recorded 7.35 feet September 29 and 30.

Regulation.— The elevation of lake surface is regulated by the operation of gates and wheels at the dam at the outlet of the lake at Ticonderoga.

Cooperation.— Gage height record for current year furnished by State Conservation Commission.

Daily gage height, in feet, of Lake George at Glen Island, for the year ending September 30, 1919

DAY	Sept.	DAY	Sept.	DAY	Sept.
1	......	11	7.75	21	7.55
2	......	12	7.75	22	7.5
3	......	13	7.7	23	7.5
4	7.8	14	7.7	24	7.55
5	7.75	15	7.7	25	7.5
6	7.7	16	7.65	26	7.45
7	7.7	17	7.6	27	7.4
8	7.7	18	7.6	28	7.4
9	7.8	19	7.55	29	7.35
10	7.8	20	7.55	30	7.35

LAKE GEORGE AT ROGERS ROCK

Location.—At boathouse in a small bay on north side of steamboat landing at Rogers Rock, Essex County.

Drainage area.— Not measured.

Records available.— July 10, 1913, to September 30, 1919.

Gage.— Vertical staff fastened to a pile in the back end of the boathouse. Datum 3.15 feet below crest of dam at outlet of lake; read once daily by George O. Cook.

Determined by levels; supercedes the estimated datum previously published.

Extremes of stage.— Maximum stage recorded during year, 4.68 feet May 24; minimum stage recorded, 2.2 feet October 27 and 29.

1913–1919: Maximum stage recorded, 4.98 feet on May 2, 1914; minimum stage recorded, 1.2 feet on November 21 and December 22, 1916.

Regulation.— The elevation of lake surface is regulated by the operation of gates and wheels at the dam at the outlet of the lake at Ticonderoga.

Cooperation.— Gage height record for current year furnished by International Paper Co.

Daily gage height, in feet, of Lake George at Rogers Rock, for the year ending September 30, 1919

DAY	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1.....	2.42	2.50	2.90	3.00	3.00	2.82	3.80	4.42	4.45	3.85	3.55	2.95
2.....	2.4	2.45	2.85	3.1	3.02	2.88	3.78	4.5	4.4	3.82	3.45	2.9
3.....	2.38	2.48	2.82	3.22	3.0	2.88	3.82	4.42	4.48	3.78	3.5	2.88
4.....	2.4	2.45	2.8	3.18	2.98	2.85	3.8	4.48	4.35	3.82	3.5	2.88
5.....	2.4	2.42	2.82	3.12	2.95	2.82	3.88	4.45	4.32	3.8	3.45	2.9
6.....	2.35	2.48	2.8	3.1	2.9	2.85	3.92	4.42	4.35	3.7	3.5	2.85
7.....	2.3	2.5	2.8	3.18	2.9	2.88	3.98	4.45	4.3	3.75	3.48	2.8
8.....	2.42	2.4	2.82	3.15	2.88	2.85	4.0	4.4	4.32	3.72	3.45	2.7
9.....	2.42	2.48	2.8	3.12	2.85	2.92	4.02	4.35	4.35	3.78	3.4	2.85
10.....	2.4	2.5	2.78	3.15	2.85	3.12	4.1	4.35	4.3	3.85	3.38	2.9
11.....	2.38	2.45	2.75	3.15	2.82	3.15	4.2	4.32	4.25	3.9	3.35	2.9
12.....	2.4	2.48	2.72	3.0	2.85	3.12	4.4	4.35	4.2	3.8	3.3	2.92
13.....	2.38	2.42	2.7	3.05	2.82	3.00	4.45	4.4	4.18	3.78	3.3	2.85
14.....	2.35	2.38	2.7	3.02	2.8	3.05	4.5	4.4	4.15	3.72	3.25	2.88
15.....	2.3	2.4	2.78	3.05	2.82	3.12	4.48	4.38	4.15	3.8	3.2	2.8
16.....	2.28	2.38	2.75	3.08	2.85	3.2	4.5	4.4	4.18	3.75	3.2	2.8
17.....	2.25	2.4	2.7	3.05	2.82	3.15	4.58	4.45	4.1	3.78	3.18	2.7
18.....	2.22	2.42	2.72	3.02	2.8	3.25	4.55	4.48	4.12	3.75	3.15	2.78
19.....	2.25	2.7	2.78	2.98	2.8	3.2	4.55	4.5	4.1	3.72	3.1	2.8
20.....	2.32	2.75	2.8	3.05	2.78	3.28	4.6	4.45	4.08	3.7	3.15	2.7
21.....	2.3	2.8	2.8	3.0	2.75	3.35	4.5	4.4	4.1	3.8	3.12	2.65
22.....	2.25	2.85	2.82	3.02	2.78	3.3	4.58	4.55	3.85	3.85	3.1	2.7
23.....	2.28	2.88	2.85	3.05	2.8	3.35	4.58	4.65	3.95	3.8	3.0	2.6
24.....	2.22	2.9	2.78	3.1	2.82	3.38	4.62	4.68	3.85	3.82	3.08	2.65
25.....	2.25	2.82	2.98	3.08	2.85	3.4	4.58	4.65	3.88	3.75	3.05	2.6
26.....	2.28	2.8	2.95	3.05	2.8	3.42	4.6	4.65	3.85	3.75	3.1	2.6
27.....	2.2	2.82	3.0	3.08	2.8	3.45	4.58	4.62	3.8	3.72	3.05	2.55
28.....	2.22	2.8	2.8	3.05	2.78	3.7	4.55	4.55	3.78	3.7	3.0	2.52
29.....	2.2	2.85	2.85	3.05	......	3.75	4.52	4.6	3.82	3.68	2.95	2.55
30.....	2.22	2.9	2.9	3.08	......	3.8	4.45	4.5	3.85	3.65	2.95	2.45
31.....	2.42	......	3.02	3.05	......	3.85	......	4.48	......	3.6	2.92	......

AUSABLE RIVER AT AUSABLE FORKS

Location.— In the village of Ausable Forks, Clinton County, immediately below junction of East and West branches and about 15 miles above mouth of river.

Drainage area.— 444 square miles (measured on topographic maps).

Records available.—August 17, 1910, to September 30, 1919.

Gage.— Chain on left bank 1,000 feet below junction of East and West branches; read by A. S. Baker.

Discharge measurements.— Made from a cable 1½ miles below gage, or by wading either near the cable or a short distance above the gage.

Channel and control.— Stone and gravel; occasionally shifting, channel divided by an island opposite the gage.

Extremes of discharge.— Maximum stage recorded during year, 9.0 feet at 8 A. M. October 6 (discharge, 15,600 second-feet); minimum stage recorded, 3.40 feet at 7 A. M. August 2 (discharge, 110 second-feet).

1910–1919: Maximum stage recorded, 10.2 feet in the evening of March 27, 1913 (discharge, roughly 25,000 second-feet); minimum stage recorded, 3.0 feet at 7 A. M. July 21, 1912 (discharge, practically zero).

Special study.—A portable water-stage recorder was installed at this station and a continuous gage-height record obtained July 11, to September 30, 1914, which showed a continual small fluctuation in stage. It was shown that monthly mean discharge based on a semi-daily gage height is in error as follows: July 11–31, 3.5 per cent; August, 4.1 per cent; September, 1914, 0.5 per cent. Some of the determinations of daily discharge showed greater errors, but these were largely compensating.

Ice.— Stage-discharge relation slightly affected by ice.

Accuracy.— Stage-discharge relation probably permanent between dates of shifting; usually affected by ice for short periods from December to March. Rating curve fairly well defined between 175 and 3,000 second-feet. Gage read to hundredths twice daily. Daily discharge ascertained by applying mean daily gage heights to rating table. Records good.

Discharge measurements of Ausable River at Ausable Forks, during the year ending September 30, 1919

DATE	Made by	Gage height	Discharge
		Feet	*Sec.-ft.*
Jan. 10a.......	M. H. Carson....................................	4.10	327
July 14........	C. C. Covert....................................	3.59	203

a Backwater present due to ice.

Daily Discharge in second-feet, of Ausable River at Ausable Forks, for the year ending September 30, 1919

DAY	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1.....	903	2,270	599	851	340	1,070	984	864	380	272	153	220
2.....	588	1,620	546	1,230	320	645	800	1,180	360	272	121	240
3.....	800	1,440	800	890	320	465	955	1,440	340	227	132	264
4.....	1,100	1,130	1,100	679	300	505	984	1,620	320	202	132	287
5.....	825	929	567	505	300	546	776	4,480	319	196	132	264
6.....	14,300	813	546	460	280	702	1,260	2,720	319	164	148	242
7.....	5,600	727	526	400	294	825	2,950	2,050	929	227	157	157
8.....	2,380	599	515	380	287	567	3,070	1,620	1,070	183	153	242
9.....	1,440	1,620	776	340	294	465	2,160	1,260	634	170	142	984
10.....	929	1,100	1,530	320	280	588	1,940	1,030	567	227	142	813
11.....	727	1,260	578	320	272	578	3,950	1,070	465	220	177	567
12.....	727	1,030	567	300	264	546	7,740	1,260	354	190	177	546
13.....	984	955	465	340	257	567	2,840	1,260	319	170	177	800
14.....	800	588	916	700	264	526	2,160	1,200	336	164	148	465
15.....	903	567	1,830	550	272	800	1,530	1,130	1,200	257	148	407
16.....	714	526	1,260	440	257	546	1,350	1,030	1,440	345	170	379
17.....	567	526	1,150	400	272	702	1,440	1,260	751	319	142	336
18.....	929	1,030	864	380	294	3,690	1,830	2,950	1,090	272	170	287
19.....	800	3,440	567	360	311	2,050	3,690	1,730	371	221	214	264
20.....	929	2,490	955	345	336	1,350	1,440	1,440	611	202	242	264
21.....	1,160	1,620	825	336	407	1,830	1,350	1,070	505	170	202	302
22.....	1,040	1,180	1,030	345	371	1,620	1,210	3,950	407	157	202	272
23.....	851	984	1,830	371	302	1,130	1,150	4,480	484	214	196	825
24.....	764	851	1,620	955	294	903	1,350	2,600	417	319	400	567
25.....	588	800	1,440	567	311	929	1,260	1,730	153	227	407	417
26.....	739	851	955	494	354	1,010	998	1,620	196	157	302	336
27.....	998	788	702	407	354	1,130	851	1,260	319	170	257	287
28.....	851	764	764	371	371	9,790	877	984	851	345	227	264
29.....	851	739	1,260	388	......	3,440	998	727	679	287	257	242
30.....	2,270	800	1,350	371	......	1,530	929	505	465	242	234	214
31.....	3,690	......	1,350	360	......	1,230	......	417	......	202	221	......

NOTE.— Stage-discharge relation affected by ice January 6–19, and January 31 to February 5. Daily discharge for these periods is approximate. Daily discharge estimated June 1–4, 15 and 18, July 11–13, August 24, September 1 and 2, by comparing with hydrograph of Saranac, Plattsburg.

Monthly discharge of Ausable River at Ausable Forks, for the year ending September 30, 1919
[Drainage area, 444 square miles]

MONTH	Discharge in Second-feet				Run-off
	Maximum	Minimum	Mean	Per square mile	Depth in inches on drainage area
October	14,300	567	1,640	3.69	4.25
November	3,440	526	1,130	2.55	2.84
December	1,830	465	961	2 16	2.49
January	1,230	300	489	1.10	1.27
February	407	257	306	.689	.72
March	9,790	465	1,360	3.06	3.53
April	7,740	776	1,830	4.12	4.60
May	4,480	417	1,680	3.78	4.36
June	1,440	153	555	1.25	1.40
July	345	157	225	.507	.58
August	407	121	196	.441	.51
September	984	157	392	.883	.99
The year	14,300	121	901	2.03	27.54

West Branch of Ausable River Near Newman.

Location.— On farm of James Dudley, about 4 miles northeast of Newman, Essex County, and 4 miles below confluence at Lake Placid.

Drainage area.— 116 square miles (measured on topographic maps).

Records available.— June 7, 1916 to December 31, 1917, and July 15, 1919 to September 30, 1919.

Gage.— Staff, in two sections, on the right bank near the residence of Mr. Dudley. Lower section is inclined, graduated from 1.0 to 6.5 feet; the upper section is vertical graduated from 6.55 to 10.1 feet; read by Jesse Martin.

Discharge measurements.— Made by wading or from cable 300 feet above gage.

Channel and control.— Solid rock.

Cooperation.— Station established and maintained by the United States Geological Survey in cooperation with the Conservation Commission.

Discharge measurements of West Branch of Ausable River near Newman, during the year ending September 30, 1919

DATE	Made by—	Gage height	Discharge
		Feet	*Sec.-ft.*
July 14*a*	C. C. Covert	2.72	69.4
14	do	2.41	32.7
Aug. 24*b*	do	3.02	101
26*b*	do	2.76	84.8

a Made by wading about one mile down stream.
b Made by wading about one mile up stream.

Daily discharge, in second-feet, of West Branch of Ausable River near Newman, for the year endin September 30, 1916

DAY	June	July	Aug.	Sept.	DAY	June	July	Aug.	Sept.
1	......	114	74	47	16	159	122	60	159
2	......	114	71	71	17	240	223	34	85
3	......	129	71	57	18	240	223	38	85
4	......	223	57	57	19	198	159	44	71
5	......	294	64	50	20	190	129	38	57
6	......	240	47	47	21	174	106	42	71
7	166	159	50	47	22	159	99	34	60
8	144	136	68	47	23	144	206	38	129
9	144	122	114	57	24	129	240	50	144
10	144	129	106	47	25	122	198	57	99
11	136	190	71	44	26	129	159	57	82
12	190	190	74	47	27	114	166	34	92
13	174	159	54	32	28	206	136	42	47
14	174	240	64	44	29	144	111	38	78
15	159	159	57	129	30	159	96	32	214
					31	......	96	38	......

Daily discharge, in second-feet, of West Branch of Ausable River near Newman, for the year ending September 30, 1917

DAY	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1	129	78	223	......	......	......	......	267	332	174	28	100
2	92	99	159	......	......	......	......	276	370	174	39	152
3	88	111	190	......	......	......	......	249	450	144	28	100
4	74	92	174	......	......	......	......	258	313	159	39	82
5	85	88	152	......	......	......	......	206	258	114	39	72
6	47	88	267	......	......	......	......	198	276	108	30	77
7	74	74	198	......	......	......	......	198	232	122	33	93
8	68	71	190	......	......	......	......	174	313	79	105	77
9	68	122	182	......	......	......	......	166	351	91	100	68
10	68	166	249	......	......	......	......	206	240	79	136	68
11	64	129	198	......	......	......	......	190	390	68	72	65
12	44	96	174	......	......	......	......	258	615	105	68	63
13	71	85	122	......	......	......	......	249	370	108	77	96
14	144	78	174	......	......	......	......	240	294	100	42	63
15	88	96	174	......	......	......	......	294	450	91	54	37
16	71	85	144	......	......	......	......	223	249	79	63	42
17	92	92	88	......	......	......	......	198	240	82	72	45
18	88	74	92	......	......	......	......	267	240	72	79	42
19	88	85	85	......	......	......	......	214	93	86	68	54
20	223	74	78	......	......	......	......	370	249	79	65	276
21	294	47	64	......	......	......	......	351	294	72	65	159
22	182	44	64	......	......	......	......	249	313	77	63	114
23	136	64	96	......	......	......	......	332	276	65	54	91
24	102	470	106	......	......	......	......	313	258	42	63	82
25	64	223	78	......	......	......	......	267	240	77	63	77
26	99	174	102	......	......	......	......	258	249	72	58	54
27	92	136	106	......	......	......	......	240	240	54	54	54
28	78	114	111	......	......	......	......	294	223	52	45	91
29	64	111	111	......	......	......	......	313	206	52	72	122
30	60	240	92	......	......	......	......	370	410	45	96	105
31	57	......	92	......	......	......	......	390	......	49	129	......

Daily discharge, in second-feet, of West Branch of Ausable River near Newman, for the year endin September 30, 1918

DAY	Oct.	Nov.	Dec.	DAY	Oct.	Nov.	Dec.
1	129	294	61	16	223	63	68
2	136	232	65	17	152	86	79
3	122	190	58	18	129	68	72
4	159	182	65	19	129	86	91
5	206	166	63	20	276	114	91
6	206	108	65	21	206	86	93
7	159	129	54	22	182	82	93
8	122	144	42	23	136	93	68
9	129	114	58	24	129	91	52
10	108	114	52	25	182	86	39
11	105	105	52	26	174	86	58
12	86	96	82	27	198	58	63
13	276	72	42	28	370	58	65
14	159	52	49	29	276	79	86
15	166	86	82	30	595	63	45
				31	490	......	45

Daily discharge, in second-feet, of West Branch of Ausable River near Newman, for the year ending September 30, 1919

DAY	July	Aug.	Sept.	DAY	July	Aug.	Sept.
1	......	60	99	16	92	53	88
2	......	70	106	17	106	53	99
3	......	67	92	18	70	50	114
4	......	60	86	19	60	63	111
5	......	60	86	20	48	129	96
6	......	60	92	21	70	79	93
7	......	57	96	22	79	60	136
8	......	38	114	23	67	60	294
9	......	38	129	24	75	92	370
10	......	33	144	25	70	72	313
11	......	53	152	26	......	71	214
12	......	60	129	27	96	86	214
13	......	63	122	28	136	86	102
14	......	50	114	29	129	93	89
15	50	53	99	30	106	60	79
				31	75	84	....

Monthly discharge of West Branch of Ausable River, near Newman, for the year ending September 30, 1916

[Drainage area, 116 square miles]

MONTH	Discharge in Second-feet				Run-off
	Maximum	Minimum	Mean	Per square mile	Depth in inches on drainage area
July	294	96	163	1.41	1.63
August	114	32	55.4	.478	.55
September	214	32	76.5	.659	.76

Monthly discharge of West Branch of Ausable River, near Newman, for the year ending September 30, 1917

[Drainage area, 116 square miles]

MONTH	DISCHARGE IN SECOND-FEET				RUN-OFF
	Maximum	Minimum	Mean	Per square mile	Depth in inches on drainage area
October	294	44	96.4	.831	.96
November	470	44	117	1.01	1.13
December	267	64	140	1.21	1.40
May	390	166	261	2.25	2.59
June	615	93	301	2.60	2.90
July	174	42	89.4	.771	.89
August	136	28	64.5	.556	.64
September	276	37	87.4	.753	.84

Monthly discharge of West Branch of Ausable River near Newman, for the year ending September 30, 1918

[Drainage area, 116 square miles]

MONTH	DISCHARGE IN SECOND-FEET				RUN-OFF
	Maximum	Minimum	Mean	Per square mile	Depth in inches on drainage area
October	595	86	197	1.70	1.96
November	294	52	109	.940	1.05
December	93	39	64.5	.556	.64

Monthly discharge of West Branch of Ausable River near Newman, for the year ending September 30, 1919

[Drainage area, 116 square miles]

MONTH	DISCHARGE IN SECOND-FEET				RUN-OFF
	Maximum	Minimum	Mean	Per square mile	Depth in inches on drainage area
July	....	....	83.0	.716	....
August	129	33	64.9	.559	.64
September	370	79	136	1.17	1.30

SARANAC RIVER NEAR PLATTSBURG

Location.—At the Indian Rapids power plant (formerly known as Lozier dam) of the Plattsburg Gas and Electric Co., about 6 miles above mouth of river at Plattsburg, Clinton County.

Drainage area.— 607 square miles (measured on topographic maps).

Records available.— March 27, 1903 to September 30, 1919.

Gages.— Crest gage a vertical staff on the angle of the wing wall at the end of the racks. Datum raised 0.76 foot August 20, 1906. Tailrace gage a vertical staff spiked to timber work dike between tailrace and river and about 50 feet below power house. Records of kilowatt output are obtained by watt meter on switchboard at half hour intervals. Inclined staff gage at cable station, a quarter of a mile below dam.

Discharge measurements.— Made from a cable at head of Indian Rapids, one-quarter mile below dam. Low-water measurements made by wading under cable or in tailrace. Gages and watt meters read by power-house operators.

Discharge rating.— Records include flow over concrete spillway 171.25 feet in crest length, a rating for which has been prepared for use of coefficients derived from experiments* made in the hydraulic laboratory of Cornell University on a model section of the dam; the discharge through two power units equipped with 300 kilowatt generators which have been rated by current meter measurements; and the discharge through two 5-foot waste gates when open. Occasional observations are made on the inclined staff gage at the cable as a check on the ratings of the spillway and turbines.

Extremes of discharge.— Maximum daily discharge during year, 3,400 second-feet April 12 and 13; minimum daily discharge, 205 second-feet July 20.

1908–1919: Maximum daily discharge recorded, 6,410 second-feet, April 20, 1914; minimum daily discharge recorded, 90 second-feet, September 28, 1914.

Special study.—A portable water-stage recorder was operated at the cable for a short period in July, 1914. Mean daily discharge, computed from its record agreed very closely with mean daily discharge derived from power-plant ratings.

Ice.— The crest of the spillway is kept free from ice so that the stage-discharge relation is not affected.

Regulation.— The lakes and ponds on the main steam and tributaries above the station comprise a water surface area of about 25.5 square miles. The actual storage afforded by these reservoirs has been largely increased by the State dam at Lower Saranac Lake, the operation of which affects the distribution of flow throughout the year.

Accuracy.— Discharge over the spillway ascertained by applying to rating table mean gage heights for 6-hour periods. Discharge through the turbines ascertained by applying to their ratings, the mean kilowatt output and head for 12-hour periods. Records fair.

Cooperation.— Gage-height records and watt meter readings furnished by Plattsburg Gas and Electric Co., Herbert A. Stutchbury, Superintendent.

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* Horton, R. E., Weir experiments, coefficients, and formulas; U. S. Geological Survey Water-Supply Paper, 200, pp. 98–100, 1907.

Daily discharge, in second-feet, of Saranac River near Plattsburg, for the year ending September 30 1919

DAY	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.
1.....	1,060	2,300	1,220	920	660	1,160	1,550	1,350	1,180	500	310	235
2.....	920	2,100	920	1,040	580	860	1,300	1,350	1,200	480	500	300
3.....	840	2,000	1,220	1,120	540	800	1,400	1,350	1,000	380	370	350
4.....	760	1,950	1,220	1,120	560	800	1,300	1,500	1,020	280	400	380
5.....	720	1,850	1,160	920	600	1,050	1,300	2,250	1,000	360	250	290
6.....	3,000	1,600	920	760	600	960	1,550	2,500	860	290	290	320
7.....	3,100	1,150	820	720	620	920	2,500	2,150	940	450	260	360
8.....	3,000	1,350	840	920	620	960	3,000	2,200	920	480	340	320
9.....	2,600	1,400	1,040	960	520	1,020	2,600	1,950	820	400	480	540
10.....	2,350	1,450	1,000	760	580	1,040	2,350	1,700	700	380	330	600
11.....	2,050	1,350	980	800	540	1,100	2,350	1,550	680	250	350	560
12.....	1,750	1,160	1,000	780	540	1,000	3,400	1,700	700	350	260	620
13.....	1,550	1,020	1,040	980	540	1,060	3,400	1,500	620	390	310	640
14.....	1,450	1,040	1,120	660	440	880	2,900	1,300	600	390	300	470
15.....	1,250	960	1,700	940	560	860	2,500	1,220	780	540	300	430
16.....	1,180	1,020	1,700	740	540	960	2,300	1,240	780	720	350	260
17.....	1,000	1,020	1,350	940	560	940	2,700	1,240	1,020	640	320	490
18.....	1,160	1,160	1,300	840	540	1,650	2,450	1,900	940	480	380	360
19.....	1,300	2,400	1,100	680	460	2,350	2,250	1,650	840	440	320	400
20.....	1,100	2,050	1,080	720	500	2,100	2,200	1,400	780	205	490	320
21.....	1,300	1,950	1,100	720	520	2,400	1,950	1,450	740	400	330	300
22.....	1,200	1,900	980	680	600	2,500	1,750	1,550	540	340	320	410
23.....	1,160	1,850	1,300	840	560	2,300	1,600	2,600	720	500	310	420
24.....	1,160	1,700	1,550	800	700	2,100	1,500	2,200	700	540	380	310
25.....	1,300	1,600	1,160	900	540	2,000	1,450	2,050	660	290	900	360
26.....	1,350	1,450	1,550	800	620	1,850	1,400	1,600	520	340	470	380
27.....	1,550	1,220	720	880	600	1,900	1,500	1,600	580	270	410	410
28.....	1,250	1,350	1,120	780	580	2,100	1,300	1,400	560	400	250	290
29.....	1,200	1,400	1,100	780	......	1,140	1,400	1,300	440	350	490	420
30.....	1,650	1,400	1,060	700	......	1,900	1,450	1,240	580	480	240	440
31.....	2,450	......	860	700	......	1,700	......	1,160	......	300	240	......

Monthly discharge of Saranac River near Plattsburg, for the year ending September 30, 1919
[Drainage area, 607 square miles]

MONTH	DISCHARGE IN SECOND-FEET				RUN-OFF
	Maximum	Minimum	Mean	Per square mile	Depth in inches on drainage area
October..........................	3,100	720	1,540	2.54	2.93
November..........................	2,400	960	1,540	2.54	2.83
December..........................	1,700	720	1,140	1.88	2.17
January..........................	1,120	660	835	1.38	1.59
February..........................	700	440	565	.931	.97
March..........................	2,500	800	1,430	2.36	2.72
April..........................	3,400	1,300	2,020	3.33	3.72
May..........................	2,600	1,160	1,650	2.72	3.14
June..........................	1,200	440	781	1.29	1.44
July..........................	720	205	407	.671	.77
August..........................	900	240	363	.598	.69
September..........................	640	235	400	.659	.73
The year..........................	3,400	205	1,060	1.74	23.70

GENESEE RIVER AT ROCHESTER.

Location.—At the Elmwood avenue bridge at the north end of South Park, 3¼ miles below the mouth of Black Creek, 3½ miles above the center of the city of Rochester, Monroe County, and 7½ miles above the mouth of the river.

Drainage area.— 2,440 square miles (determined by engineers of the New York State Conservation Commission).

Records available.— Discharge records February 9, 1904, to September 30, 1918. Fragmentary records prior to this period published in Water Supply Papers 24, 65 and 97. Gage height records October 1 to 10, 1918, and March 3 to June 7, 1919. Rating does not apply for these periods on account of Barge Canal construction operations in progress in river channel.

Gage.— Gurley water-stage recorder installed in December, 1910, in the pump house immediately below the bridge on the right bank. Recorder inspected by Geo. A. Bailey. Prior to December, 1910, a staff gage bolted to the downstream end of the first pier from the right abutment. Elevation of zero of gage 506.848, Barge Canal datum, and 245.591, Rochester City datum. Record suspended October 11, 1918, on account of dredging operations in river channel.

Vertical enamel staff gage installed March 3, 1919, above site of temporary dam, giving elevations referred to Barge Canal datum; record obtained March 3 to June 7, 1919. Gage read by J. Bendon.

Discharge measurements.— Made from downstream side of Elmwood avenue bridge.

Discharge measurements of Genesee River at Rochester, during the year ending September 30, 1919

DATE	Made by	Gage height	Discharge
		Feet	*Sec.-ft.*
Oct. 5	E. D. Burchard	0.77	1,050
Nov. 9	do	1.07	1,540
Mar. 3	do	*a* 508.61	2,300
4	do	*a* 508.37	1,830
April 5	J. W. Moulton	*a* 508.34	1,740
7	do	*a* 508.58	2,240
8	do	*a* 508.60	2,210
15	C. C. Covert	*a* 510.79	5,830
16	J. W. Moulton	*a* 509.86	4.130
17	do	*a* 510.52	5,390
May 14 *b*	do	*a* 514.6	16,100

NOTE.— Due to Barge Canal construction operations. discharge records ceased September 30 1918, and station was officially discontinued. Gage heights obtained after that date cannot be applied to rating table to give accurate estimates of discharge.

a Barge Canal Datum.

b Debris on control.

Daily gage height, in feet, of Genesee River at Rochester, for the year ending September 30, 1919

DAY	Oct.	Mar.	April	May	June
1	0.98	......	508.40	509.30	509.32
2	0.84	......	508.27	508.83	509.20
3	0.55	508.69	508.20	508.93	508.67
4	0.55	508.25	508.18	508.78	508.52
5	0.60	508.17	508.17	509.00	509.15
6	0.56	508.33	508.47	508.57	510.45
7	0.51	508.47	508.58	509.03	511.47
8	0.89	508.18	508.60	508.83	....
9	1.05	508.55	508.65	508.72	....
10	0.86	510.80	509.83	510.03	....
11	......	510.73	512.77	516.65	....
12	......	509.80	514.60	519.17	....
13	......	509.17	514.47	520.+	....
14	......	508.90	512.20	518.87	....
15	......	508.32	510.53	515.23	....
16	......	508.33	509.83	513.20	....
17	......	509.15	510.48	511.57	....
18	......	511.37	510.13	511.70	....
19	......	511.45	509.45	512.93	....
20	......	510.10	509.12	511.23	....
21	......	509.17	508.85	513.97	....
22	......	508.83	508.73	517.22	....
23	......	508.65	508.63	520.00	....
24	......	508.47	508.43	520.70	....
25	......	508.15	509.23	520.92	....
26	......	508.20	509.35	519.15	....
27	......	508.13	509.42	516.95	....
28	......	508.23	509.73	513.50	....
29	......	508.23	509.83	511.10	....
30	......	508.32	509.78	509.72	....
31	......	508.30	......	509.62	....

APPENDIX C

POWER AND STORAGE POSSIBILITIES OF THE AUSABLE RIVER

POWER AND STORAGE POSSIBILITIES OF THE AUSABLE RIVER

Introduction. In accordance with its policy of investigating the water power resources of the State, the Commission made a survey of the Ausable river in the year 1915. This work included detailed surveys of promising reservoir sites, an accurate survey of the river profile and careful investigation of all developed and undeveloped power sites. Data on the wheel installation and the use of power at all developed sites were obtained from the power owners. All data thus collected have been carefully studied in the office and are herein presented in tabular form. For a detailed description of the methods used by the Commission's engineers in studying the power and storage possibilities of a stream see the pamphlet entitled, "Power and Storage Possibilities of the Black River."

The Ausable Watershed. The Ausable Watershed lies on the eastern slope of the Adirondack mountains and covers 518 square miles. Within this area is found some of the most notable scenery of New York State. The west branch of the Ausable river rises on the north side of Mt. Marcy, flows in a northerly direction to its junction with Chubb river, the outlet to Lake Placid, thence following a northeasterly direction, it drops rapidly through Wilmington Notch, over High Falls and through The Flume, finally joining the east branch at Ausable Forks. From this point the Ausable river continues in a northeasterly direction until it enters Lake Champlain, ten miles south of Plattsburg. About five miles above its mouth the river passes through the justly famous Ausable Chasm. The east branch rises on the south side of Mt. Marcy, passes through the Ausable lakes and flows in a northerly direction through Keene valley to its junction with the west branch at Ausable Forks.

The two outstanding physical features of the Ausable watershed are: (1) the small amount of natural storage; only 6.4 square miles, or 1.2 per cent of the total area, is water surface and practically none of it is swampy; (2) the very rapid rate at which the river falls; in its upper reaches from Lake Placid to Ausable Forks, a distance of 26 miles, the fall is 1,320 feet, and 580 feet of this is concentrated between Wilmington Notch and the lower end of The Flume, a distance of four miles. From the upper Ausable lake to Ausable Forks, a distance of 30 miles, the fall is 1,450 feet, 860 feet of which occurs in the first four miles below the lower Ausable lake. From Ausable Forks to Lake Champlain, a distance of 19 miles, the fall is 445 feet, of which 130 feet is in the Ausable Chasm, 60 feet being in the fall at the entrance and 70 feet in one mile of rapids.

Although the headwaters of the Ausable river spring from the highest mountains and in the wildest section of New York State, the lower reaches pass through very fertile agricultural lands. The drainage area at different points is given in the following table:

POINT	Miles from Lake Champlain	Elevation	Drainage area Sq. miles
Mouth	0	96	518
Ausable Chasm	5	300	500
Keeseville	7	400	475
Ausable Forks (both branches)....	20	535	434
Ausable Forks (west branch).....	20	535	235
Wilmington (west branch).......	30	980	140
Cherrypatch pond reservoir site (west branch)	38	1,605	115
Keene (east branch)	35	820	88
Lower Ausable lake (east branch).	48	1,960	25

Hydrology. Only meagre rainfall data are available on the Ausable watershed but it can be said that the annual precipitation on the Ausable watershed varies from about 28 inches at Lake Champlain to about 34 inches at the head waters, the average being about 32 inches. For the period 1910–1918, during which stream flow records were kept on the Ausable river at Ausable Forks, the annual run-off has varied from 14.7 inches in 1915 to 29.9 inches in 1918, with a mean value of 22.0 inches during the entire period.

Stream Flow. A gaging station was established in August 1910, at Ausable Forks immediately below the junction of the east and west branches and daily records of the stream flow are

Ausable River at High Falls.

available to date. In 1916 a station was established one and one-half miles above Wilmington Notch and is known as "West Branch of Ausable Forks at Newman's." Difficulty has been experienced in obtaining efficient observers and records are available only for the following periods:

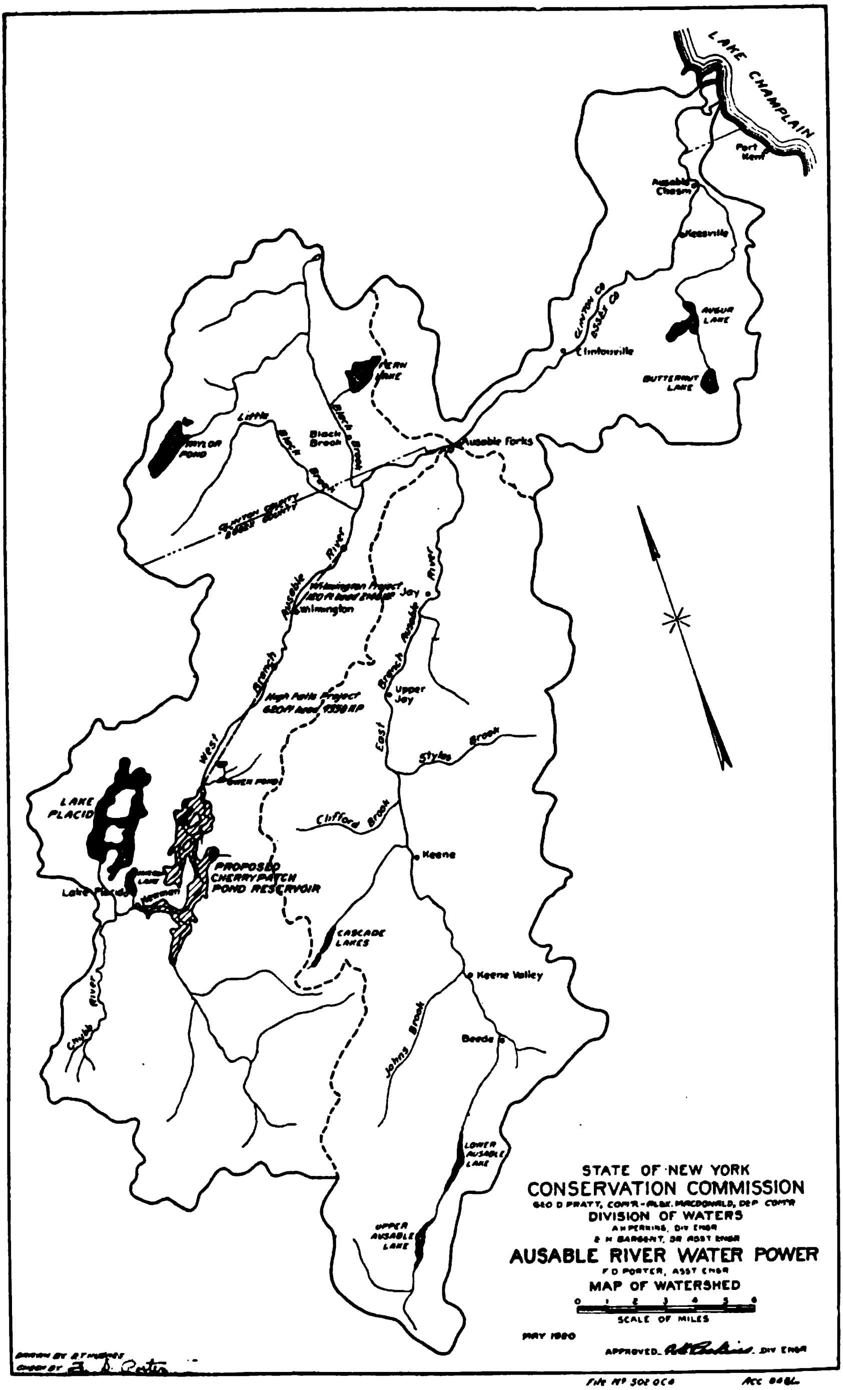
June 7 to December 31, 1916.
May 1 to December 31, 1917.
July 15 to December 31, 1919.
April 14, 1920, to date.

The records obtained at these stations have been published in the annual reports of the Commission.

Need of Regulation. The stream flow records at Ausable Forks show a wide fluctuation, varying from a minimum flow of 50 cubic feet per second on July 21, 1912, to a maximum of 25,000 cubic feet per second on March 27, 1913. There is little natural storage on the Ausable river and the only artificial storage is found on Black brook, where two small reservoirs are maintained by the J. and J. Rogers Co. at Taylor pond and Fern lake. The capacity of these two reservoirs is estimated to be 500,000,000 cubic feet.

Storage Possibilities. A careful examination of the topography along the Ausable river revealed three storage basins with good dam sites and of sufficient capacity to warrant detailed study. On the west branch, two miles above Wilmington Notch, is the largest basin, which has been called the Cherrypatch Pond reservoir site. On the east branch there are two possible reservoir sites, one at Keene Valley and one at the Ausable Lakes.

Ausable Lakes Reservoir. At the present time a low wooden dam is maintained at the outlet of the lower Ausable lake to hold the water surface as nearly as possible at constant elevation. This dam is founded on rock and ledge rock outcrops at various points in the banks above the dam, showing that it is a suitable site for a masonry dam. The drainage area above this point is 25 square miles and as our stream flow studies show that a storage of about 22 million cubic feet per square mile is required to regulate the Ausable River at any point, a reservoir capacity of 550 million cubic feet would be necessary in the Ausable Lakes to practically completely control the flow. Such a



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reservoir would require the raising of the level of the Lower Ausable Lake forty feet and the Upper Ausable Lake, eight feet. The estimated cost of this project is $484,000 or $880 per million cubic feet, which is more than stored water is worth on this stream and renders the project unfeasible.

Between Ausable Lake and Beede, four miles below, there is a total fall of 860 feet. The cost of developing this head in connection with the storage reservoir at Ausable Lake, is $406 per horsepower for development of 2,440 horsepower. This is a greater expenditure than the present price of power warrants. This project is rendered still less attractive by the absence of transportation facilities and the lack of a nearby market for power, together with the objection to such a project from the Adirondack Mountain Reserve Club.

Keene Valley Reservoir. Keene Valley offers a suitable site for a storage reservoir; the river flows through a broad flat valley about one-quarter of a mile wide and three miles long, and a dam site exists at Hulls Falls, three miles below the village of Keene Valley. The drainage area at this point is 82 square miles, which requires a reservoir capacity of about 1.8 billion cubic feet to practically completely regulate the flow. Such a reservoir would be 75 feet deep at Hulls Falls and would flood out the village of Keene Valley. The topography at Hulls Falls is not well adapted for a dam of this height. Though it could be founded on rock in the river bed, yet the valley is rather wide and the top of such a dam would be 2,000 feet long. About 1,500 feet below Hulls Falls the valley is much narrower but a dam built at this site would have to be 140 feet high to impound the required storage. The property damage caused by the construction of such a reservoir would be great, seven miles of State highway would be flooded together with 650 acres of good farming land and the entire village of Keene Valley. It is estimated that such a reservoir would cost over $625 per million cubic feet, which is far more than the stored water is worth at present.

Cherrypatch Pond Reservoir. About 4½ miles northeast of Lake Placid Village and 1½ miles above Wilmington Notch the river passes through a narrow rocky gorge furnishing an excellent dam site. Ledge rock is plainly evident in the bed of the river

and on the left bank which rises on a 1½ to 1 slope. The right bank rises on a more gradual slope of 3 to 1 and while ledge does not appear on the surface, the indications are it can not lie far beneath. The drainage area at this point is 115 square miles which requires a storage capacity of 2.5 billion cubic feet for good regulation. A dam with spillway crest 90 feet above the river bed at the dam site, will impound this amount of water and will create a reservoir six miles long, flooding about 2,000 acres of land, 600 acres of which are farming land, 200 are water surface and about 1,200 acres are timber and burned-over land. The State owns 350 acres in this basin. The State highway from Lake Placid to Wilmington passes through this reservoir and about 3½ miles of it would have to be relocated. The highway from Lake Placid to North Elba would have to be raised about 15 feet for a short distance, or it could be relocated and carried across the river about 3,000 feet farther upstream. There are also about 3½ miles of dirt road paralleling the river that would probably be abandoned. The Lake Placid electric light plant would be submerged. A masonry dam with an overfall section can be constructed on this dam site, or a rock fill dam can be built and a spillway channel cut through a saddle just west of the dam site. The construction cost is high but is not prohibitive. This is the only site on the West Branch for a storage rseervoir of any magnitude and the only site on either branch where it seems possible to obtain a considerable amount of storage at anything like a reasonable cost. The estimates given in this report are based on prevailing prices for material and labor in 1919. The estimated cost of this reservoir is as follows:

Dam and appurtenances	$471,000
Relocation of highway	100,000
Property damage	116,000
Clearing reservoir site	30,000
Engineering and contingencies	100,000
Interest during construction	78,000
	$895,000
Capacity	2,500,000,000. cu. ft.
Cost per million cubic feet	$358

The available head below this reservoir is 1,289 feet, making the cost less than $0.28 per million cubic feet storage per foot of fall. As the energy added to the river by this regulation totals 5,384 horsepower years, the cost per horsepower year is $166.

The economic limit of storage in this reservoir, assuming regulation for the dam site, is 2.5 billion cubic feet; but a study has been made, the results of which are shown in the Power Table, of the effects of the regulation of this reservoir for Clintonville, in which case a storage of 4.0 billion cubic feet in this reservoir would be economical. The estimated cost of such a reservoir is as follows:

Dam and appurtenances	$631,000
Relocation of highway	100,000
Property damage	118,000
Clearing reservoir site	40,000
Engineering and contingencies	130,000
Interest during construction	110,000
	$1,129,000
Capacity	4,000,000,000. cu ft.
Cost per million cubic feet	$283
Cost per foot fall per million cubic feet	$0.22
Cost per horsepower year added	$314

Other Storage Possibilities. As the Ausable River can be completely controlled at the dam site by the construction of the Cherrypatch Pond Reservoir, no consideration is given to the storage possibilities above that point. The drainage area at the dam site can, however, be slightly increased by constructing a 30 foot dam at the outlet of Owen Pond and so causing the run-off from 4.4 square miles to overflow into the Cherrypatch Pond Reservoir. This diversion would permit the storage in the reservoir to be increased 100 million cubic feet or to 2.6 billion cubic feet.

Black Brook Reservoir. Reference has been made to the two small storage reservoirs on the Black Brook watershed. These are operated principally in connection with a power development at Black Brook. It would seem that this watershed can be almost

Ausable River at The Flume.

completely controlled. The drainage area at the hamlet of Black Brook is 46.9 square miles, which has been increased to 56.5 square miles by the diversion of Little Black Brook about one-half mile above East Kilns. Plans are being prepared by the J. and J. Rogers Company for building a dam across Taylor Pond outlet about one and one-half miles below the Pond and for diverting Little Black Brook into this new reservoir. This project will control 21.8 square miles of watershed. About three miles above Black Brook there is an excellent dam site. Excluding the 21.8 miles mentioned above in connection with the Taylor Pond Reservoir, the contributory drainage area at this point is 25.4 square miles, requiring about 550 million cubic feet storage for its complete regulation. A 50-foot dam will create a reservoir of this capacity. A reconnaissance of this basin indicates that because of the low divide between the Ausable and the Salmon River watersheds, it would probably be necessary to construct a dike across the divide to keep the stored water from flowing into the Salmon River. Between this dam site and Black Brook there is a contributory drainage area of 9.3 square miles, 3.4 square miles of which is controlled at Fern Lake, leaving 5.9 square miles to be controlled in part by the power dam at Black Brook.

With this amount of storage a minimum flow of 67 cubic feet per second could be maintained and, for 60 per cent. of the time, the flow would be 78 cubic feet per second. With the present developed head at Black Brook of 125 feet, and the proposed regulation, 760 continuous horsepower could be developed and for 60 per cent. of the time, 886 horsepower. Below the mouth of Black Brook there is a total working head of 549 feet. Regulation of Black Brook would add 1,800 continuous horsepower and 1,050 horsepower for 60 per cent. of the time.

Augur Lake Reservoir. By building a 35 foot dam across Augur Lake outlet about 2½ miles below the Lake, it is possible to divert this water into the Ausable River just above Keeseville. It also appears possible to obtain a certain amount of regulation at this point but the data at hand are not sufficient to determine the economic amount of such storage. The drainage area at this proposed dam site is about 19 square miles and without regulation

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the minimum flow at Keeseville would be increased 5.5 cubic feet per second by this diversion and the flow for 60 per cent. of the time would be increased 17 cubic feet per second. With 222 feet of head that can be developed below this diversion, 110 continuous horsepower would be added, and for 60 per cent. of the time 340 horsepower would be added.

Method of Regulation. As stated above it does not now appear feasible to obtain any storage on the East Branch of the Ausable River. On the West Branch but one site has been considered, that at Cherrypatch Pond and the benefits that would result from storage capacities of 2.5 billion cubic feet and of 4.0 billion cubic feet at this point have been carefully worked out. Only general studies were made of the benefits that would result from regulation on Black Brook and on Augur Lake Outlet and these have been already referred to. The limited data available in this office and the smallness of the project do not warrant a detailed study of these projects.

The greatest concentration of fall on the Ausable River is found in the vicinity of High Falls and a study was made to determine the benefits resulting from a storage of 2.5 billion cubic feet regulated for this point. At the present time, however, all the power developed on the Ausable river lies within nine miles of Clintonville. Consequently as hereinbefore stated a study was made to determine the benefits that would result with the Cherrypatch Pond Reservoir regulated for Clintonville. A reservoir capacity of 4.0 billion cubic feet was considered economical in this study. The benefits that would accrue to the various power sites have been carefully compiled and are given in tabular form at the end of this work. In the following discussion of the power developments, however, all reference to regulation is based on 2.5 billion cubic feet regulated for High Falls.

POWER DEVELOPMENTS AND POSSIBILITIES.

It is well known that a wheel installation to utilize only the minimum flow at any given point, is not the economic limit of development. Just what the limit of economic installation is, requires careful consideration of all the factors involved. What is best for one plant might not do for another. For the purposes of this study we have assumed that the limit of economic development is secured when the wheel installation is such that the plant can operate continuously for 60 per cent. of the time. These values have been obtained from power-percentage-of-time curves computed from the records of the flow of the Ausable River at Ausable Forks. For discussion of stream flow studies see "Power and Storage Possibilities of the Black River." The estimated run-off at other points of the river were obtained from the Ausable Forks records by a direct drainage area ratio.

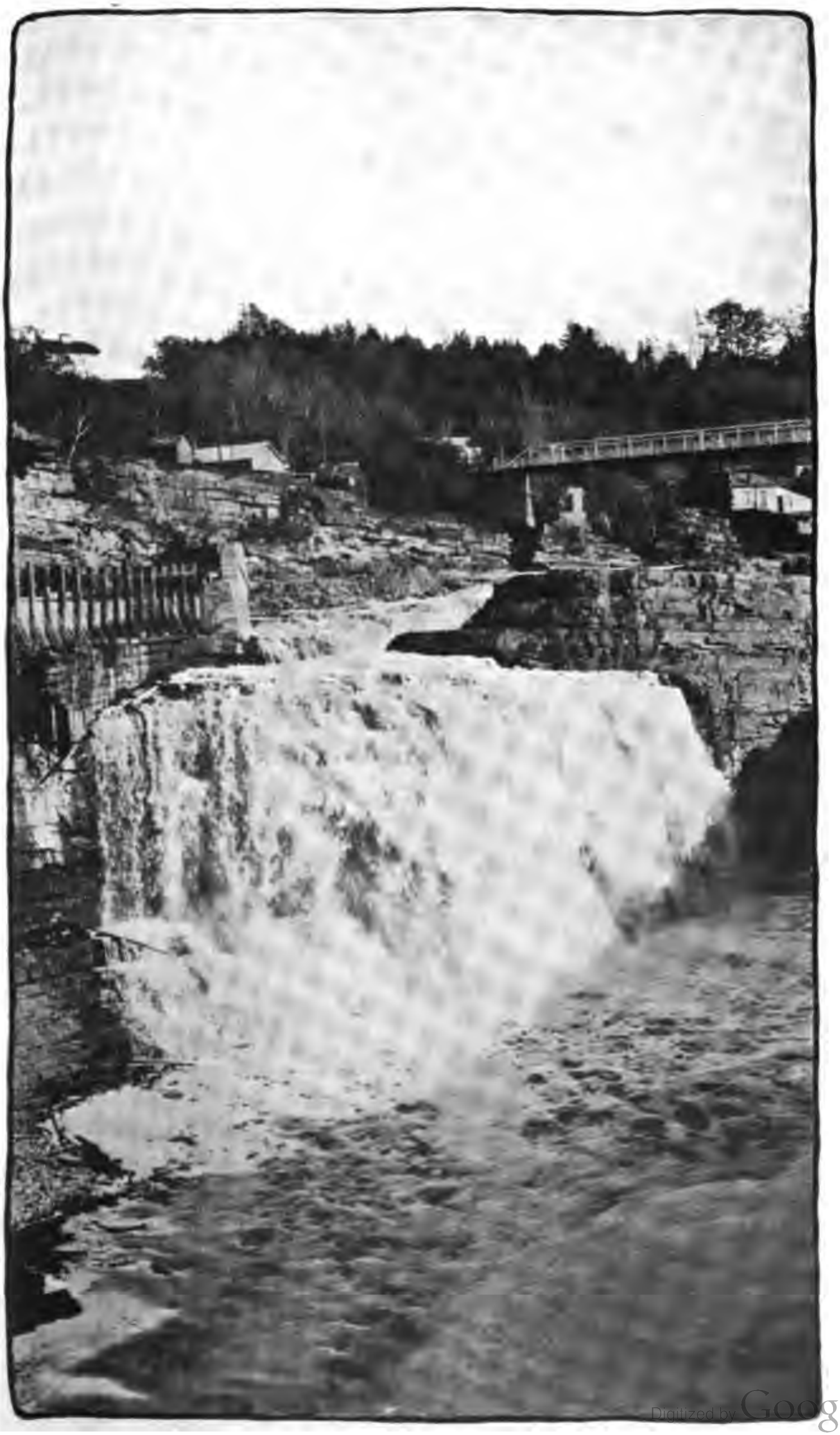
A brief description of the existing developments on the Ausable River is given on the following pages, together with an outline of possible new developments and improvements that might be made to the present plants. The physical possibilities are given below, but the determination of whether or not the projects are feasible requires more exhaustive surveys and studies than it has been deemed advisable to make at the present time.

East Branch

We have already shown that it does not appear feasible to obtain any regulation on this branch of the Ausable River, therefore, any extensive power development is out of the question at the present time. The local demand for power can probably be met by small developments of the natural run-off of the river.

Ausable Lake — Beede Project. From the water surface of the Lower Ausable Lake to about one-half mile below Beede, there is a total fall of 860 feet in a distance of about 4 miles. A low pressure pipe line can be laid from Ausable Lake along the hydraulic grade line on the left bank of the river to a surge tank about one-half mile west of Beede from which a high pressure conduit would lead down to the river, making available a working head of about 720 feet. With the present run-off and head of 720 feet about 485 continuous horsepower can be developed, which for 60 per cent of the time is increased to 1,430 horsepower.

Hulls Falls. From Hulls Falls to Keene there is a total fall of 150 feet. This, however, covers a distance of one and one-half miles. At Hulls Falls a drop of 30 feet is found in a distance of 400 feet, which can be developed inexpensively by a low dam at



Ausable River at Entrance to The Chasm.

the top of the falls where rock foundation exists. Sixty-six horsepower can be continuously maintained at this point and 195 horsepower for 60 per cent. of the time.

Keene. At Keene there is a timber dam 12 feet high from which a penstock runs down stream for 450 feet to a saw mill and electric light plant giving a total head of 19 feet. Forty-seven horsepower can be developed here continuously with this head, and 133 horsepower for 60 per cent. of the time. By going upstream about 2,000 feet above the present dam an excellent dam site is found. Data not available to show just how a dam can be built here to advantage, but it seems feasible to construct a pipe line to the present power house, and obtain a net head of 75 feet. Such a head would produce 184 continuous horsepower and 525 horsepower for 60 per cent. of the time.

Upper Jay. A timber dam, 7 feet high, is built across the Ausable River about one and one-quarter miles below Upper Jay. A wooden flume leads from this dam to a sawmill 100 feet below and to a power house 500 feet below. Nine feet of head is developed at the sawmill and 11 feet at the electric light plant. The present installation of 161 horsepower at these plants can operate at full capacity for about 40 per cent. of the time. Probably all the power is being produced at this plant that is feasible of development.

Jay. At Jay a timber dam four feet high founded on rock diverts water into an open flume which carries it to a grist mill and a butter factory. Twenty feet of head is developed. A dam 20 feet higher than the present dam could be built without great difficulty, thus giving 40 feet head on the wheels and also creating considerable pondage. Such a development would give 180 continuous horsepower and 510 horsepower for 60 per cent. of the time.

West Branch

High Falls. From the Cherrypatch Pond Reservoir dam site to the lower end of the Flume there is a total fall of 615 feet which added to the average water stage in the proposed reservoir gives a grand total of 690 feet. It would seem that this head could best be developed in one plant because of the reduction of

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operating charges. Such a project, however, calls for a low pressure conduit 5.7 miles long laid along a steep and somewhat inaccessible mountain side. This conduit would terminate in a surge tank from which a high pressure conduit would lead down the mountain side to the river about a mile distant. A net head of 620 feet could be realized on the turbines. With 2.5 billion cubic feet at Cherrypatch Pond Reservoir regulated for this development, 8,350 continuous horsepower can be produced and 9,350 horsepower for 60 per cent. of the time.

Wilmington. A timber dam, 18 feet high, is maintained at Wilmington for river driving purposes but no power is developed at the dam. By raising this dam ten feet, water would be backed up to the proposed High Falls power development and a pondage of 150 million cubic feet created. Below Wilmington the river falls about 122 feet in two and one-half miles. By constructing the above mentioned dam and laying a conduit along the hillside a total fall of 150 feet can be developed and the effective head on the turbines should be 120 feet. With the proposed regulation of 2.5 billion cubic feet a minimum of 1,700 horsepower can be maintained, and 2,140 horsepower for 60 per cent. of the time.

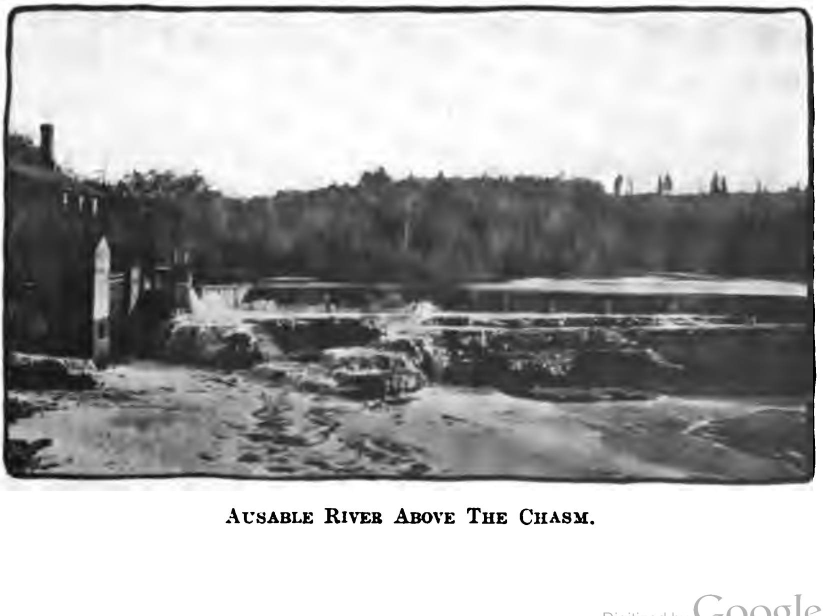
Ausable Forks. A masonry dam 35 feet high has been constructed in a narrow rocky gorge one and one-half miles above Ausable Forks, from which a conduit leads down stream for 4,800 feet, developing a gross head of about 100 feet. Just below the tailwater raceway of this development a low timber dam has been built across the river with 1,000 feet of conduit leading downstream to the mouth of the East Branch. The gross head developed here is 20 feet. Two schemes present themselves for very materially increasing the power output at this place. The site of the present concrete dam is most excellent for a high dam. Three hundred feet above this dam the river passes through a narrow rocky gorge with very steep slopes on both sides and it is possible to build at this site a dam 175 feet high or 140 feet higher than the present dam. By extending the pipe line to Ausable Forks from such a dam a gross head of 260 feet can be realized. Another plan that might be worked out for the development of this power is to construct a combination reinforced concrete and earth dam across the Ausable river, about four miles above Ausable Forks and a quarter of a mile below the mouth of Black brook. This dam would be 60 feet high, backing water to the tailwater of the proposed Wilmington development. Such a dam would create a pondage of 500 million cubic feet. The gross head from the crest to Ausable Forks is 300 feet and of this 259 feet should be effective on the wheels. With the proposed regulation 4,300 continuous horsepower can be developed and 6,640 horsepower can be produced for 60 per cent. of the time.

Clintonville. Two timber dams are maintained at Clintonville. The upper one is 13 feet high and 40 horsepower is developed at a sawmill. The lower dam is eight feet high and develops no power. It is possible to build a dam 65 feet high at the site of the upper dam, carry the water 2,000 feet down stream in a penstock and thus develop a gross head of 70 feet. Careful surveys and studies are needed to determine the exact height as valuable farm lands would be flooded and some State highway would have to be relocated. With a net head of 68 feet on the turbines and the proposed regulation a total of 1575 horsepower can be developed continuously and 2880 horsepower for 60 per cent. of the time.

Keeseville. At Keeseville, two timber dams are maintained about 1400 feet apart. The upper dam is 13 feet high from which water is distributed to four separate mills and developed under heads of from 12 to 13 feet. An excellent dam site is found about 1200 feet further upstream. A dam 40 feet high with crest at elevation 445 can be built here on rock foundation creating a head of 33 feet. With the proposed regulation, 785 continuous horsepower can be developed at this site and 1450 horsepower for 60 per cent. of the time.

The lower dam is a timber structure 10 feet high, founded on rock which distributes water to five mills where it is developed under heads varying from 9 to 21 feet. This dam can be raised eight feet so that water will back up to the tailrace of the proposed upper dam and a total head of 29 feet will be available. With the proposed regulation, 690 continuous horsepower can be maintained and 1275 horsepower for 60 per cent of the time.

Ausable River at Alice Falls.

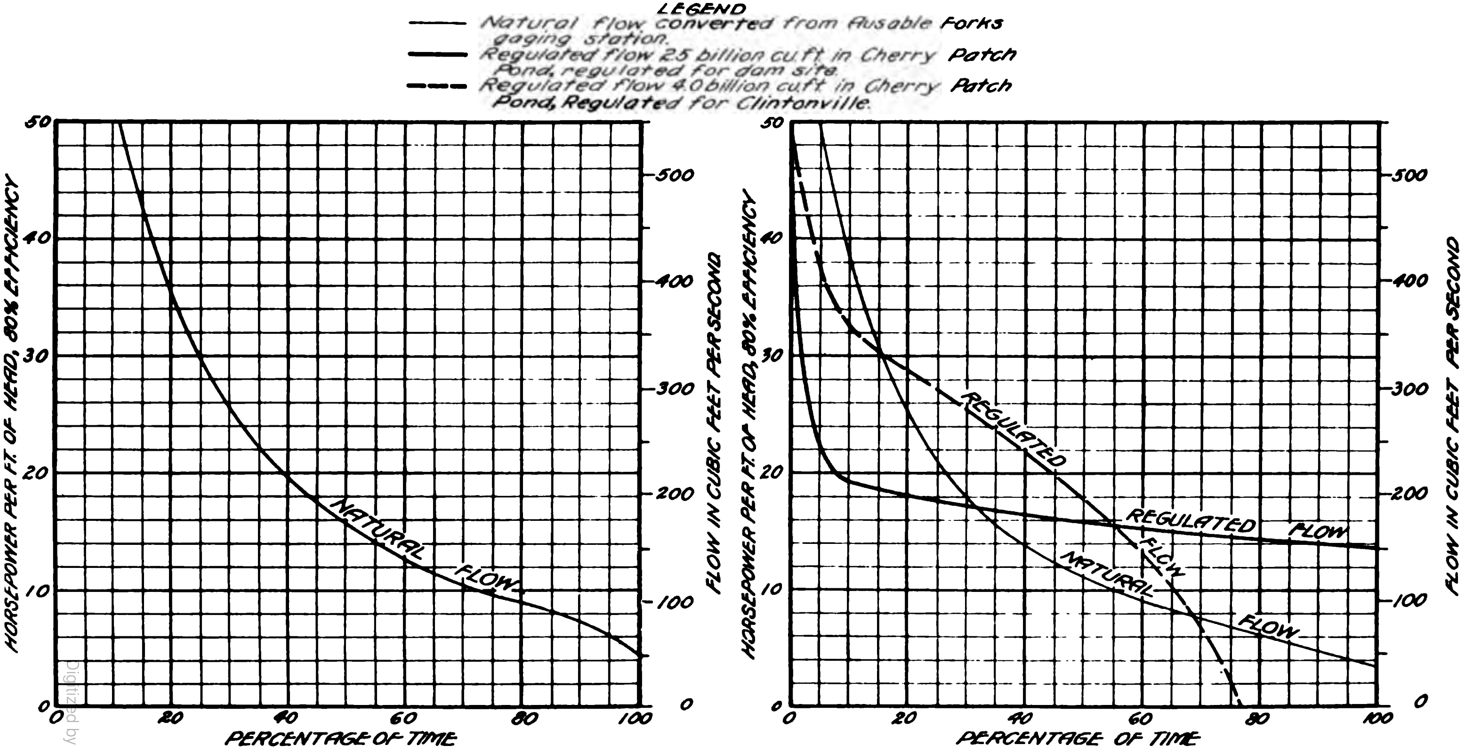


Ausable River Above The Chasm.

Alice Falls. About 1400 feet above Alice Falls stands an old timber dam 14 feet high which was once maintained in connection with a match factory but at which no power is now developed. At Alice Falls the water is diverted into a headrace by a low masonry dam and a head of 47 feet is obtained on a wheel installation of 2,000 horsepower. An eight foot timber dam stands about 200 feet above the highway bridge at Ausable Chasm, which makes available with the use of a head race about 24 feet head. The plant is now being overhauled and is being equipped with new wheels of 620 horsepower. This plant will be able to operate at full capacity for about 82 per cent. of the average year. At the entrance to Ausable Chasm the river takes a sheer drop of 60 feet. There is no dam at this point but one-half the flow is diverted into a headrace and an effective head of 56 feet is realized. No attempt is made to develop the other half of the flow at this point.

From the crest of the dam above Alice Falls to the foot of the falls at Ausable Chasm, there is a total drop of 149 feet, 130 feet of which is being partially utilized with a wheel installation of 2970 horsepower. The total head can be raised to 164 feet by building a 30-foot dam at Alice Falls. There is good rock foundation for such a dam and the banks are fairly steep. Great economy could be secured by developing all the power in this vicinity at one plant. By running a conduit from the proposed dam at Alice Falls to the entrance of the Chasm, a net head of 160 feet could be utilized, which would supply 3810 continuous horsepower and 7040 horsepower for 60 per cent. of the average year.

In Ausable Chasm itself there is a further fall of 70 feet but it does not seem to be commercially feasible to develop it at this time. There is a total drop of 287 feet from the crest of the proposed dam at Alice Falls to Lake Champlain which could be developed by carrying the water in an open canal along the hillside to Port Kent and dropping it into Lake Champlain. To make such a development economical it would be necessary to divert the water from Ausable Chasm. The senic beauty of the Chasm is so great, however, that the demands for water to preserve its charm far outweigh the demands for power. Studies have been made by the Commission's engineers to show what results can be obtained by maintaining a certain minimum flow through the



JAY
Drainage Area, 163 Sq. Miles

CHERRY PATCH POND
Drainage Area, 115 Sq. Miles

AUSABLE RIVER WATER POWER

POWER–PERCENTAGE OF TIME CURVES—AUSABLE RIVER

(Period June 1, 1910 to May 31, 1919)

Acc. No. 10,221 File No. D510·4CA

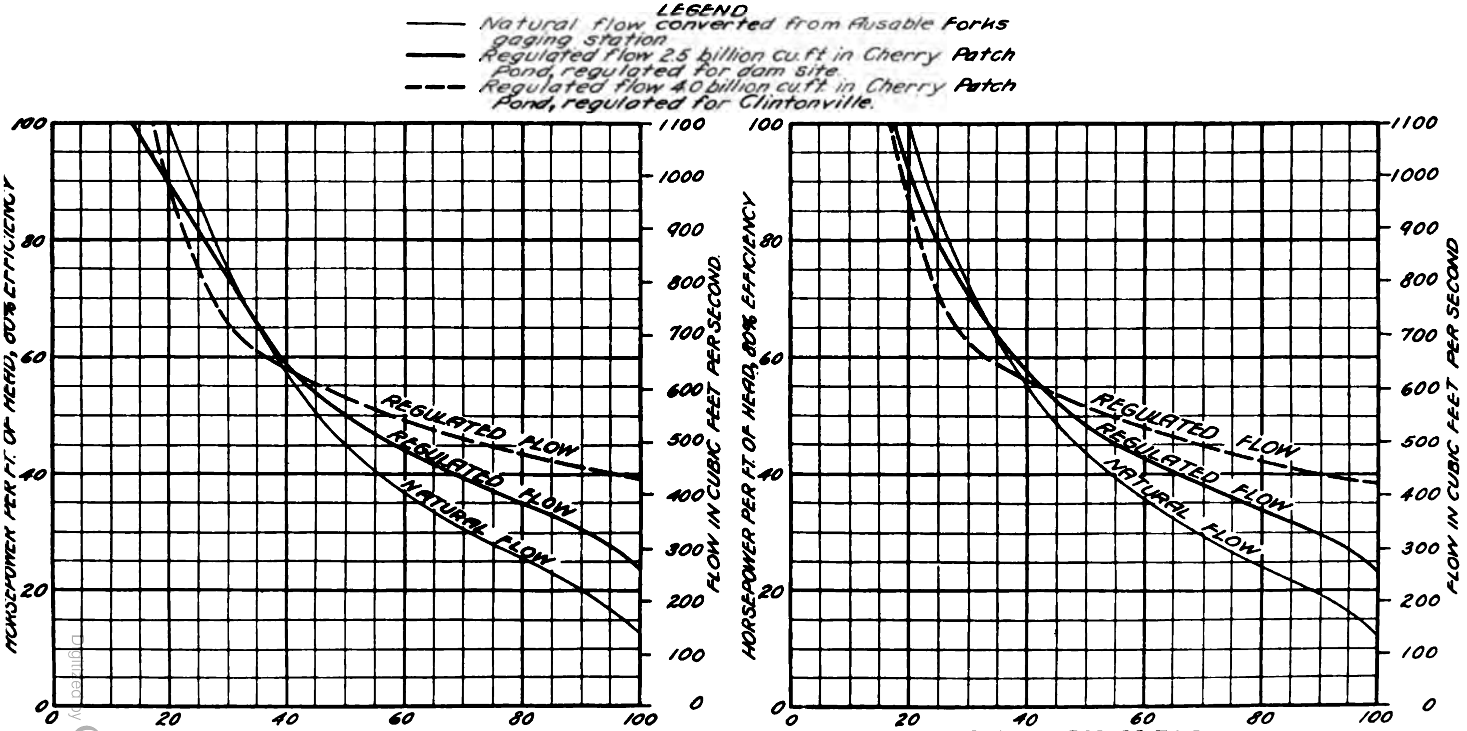
Chasm during the tourist season and by using the surplus water in a power development around the Chasm. As a rule the period of minimum stream flow includes the summer months so in this study the average flow for the three dryest months of each year for a period of 10 years has been used. It was found that a steam plant equal in capacity to the hydraulic plant would be required for such a development. Since the study for the flow to be maintained in the Chasm was based on the natural stream flow and the resulting flow available for power was taken from the proposed regulated flow, it is readily seen that this method of power development is not feasible at the present time.

Explanation of Power Table.

Information in regard to the power that is being developed and can be developed under new and improved conditions at the various power sites on the Ausable River is herewith given in tabular form. It will first be noted that this table is divided into three main divisions. The first division gives the statistics of the various powers under present conditions, that is, present head, present wheel installation and with no regulation of flow except that now being obtained from two small ponds on Black Brook as hereinbefore described.

The head now being used at the various developments does not seem to be the maximum possible, consequently in the second and third parts of this table an effort has been made to show the power that can be developed by utilizing all the head available within a reasonable distance of the power house and by developing all of this power at one power house. The second part of this table lists the expected stream flow at the various power sites together with the resulting energy when 2.5 billion cubic feet of storage at Cherrypatch Pond Reservoir is regulated for best results at High Falls. In the third part of the table is given the expected stream flow and resulting energy when 4.0 billion cubic feet storage at Cherrypatch Pond Reservoir is regulated for best results at Clintonville.

The elevations given in column IV are referred to sea level. In some instances where several plants are operating at the same dam but are using different heads, the average head has been used



KEESVILLE
Drainage Area, 474 Sq. Miles

CLINTONVILLE
Drainage Area 453 Sq. Miles

AUSABLE RIVER WATER POWER

POWER-PERCENTAGE OF TIME CURVES—AUSABLE RIVER

(Period June 1, 1910 to May 31, 1919)

Acc. No 10,222 File No D510·4CA

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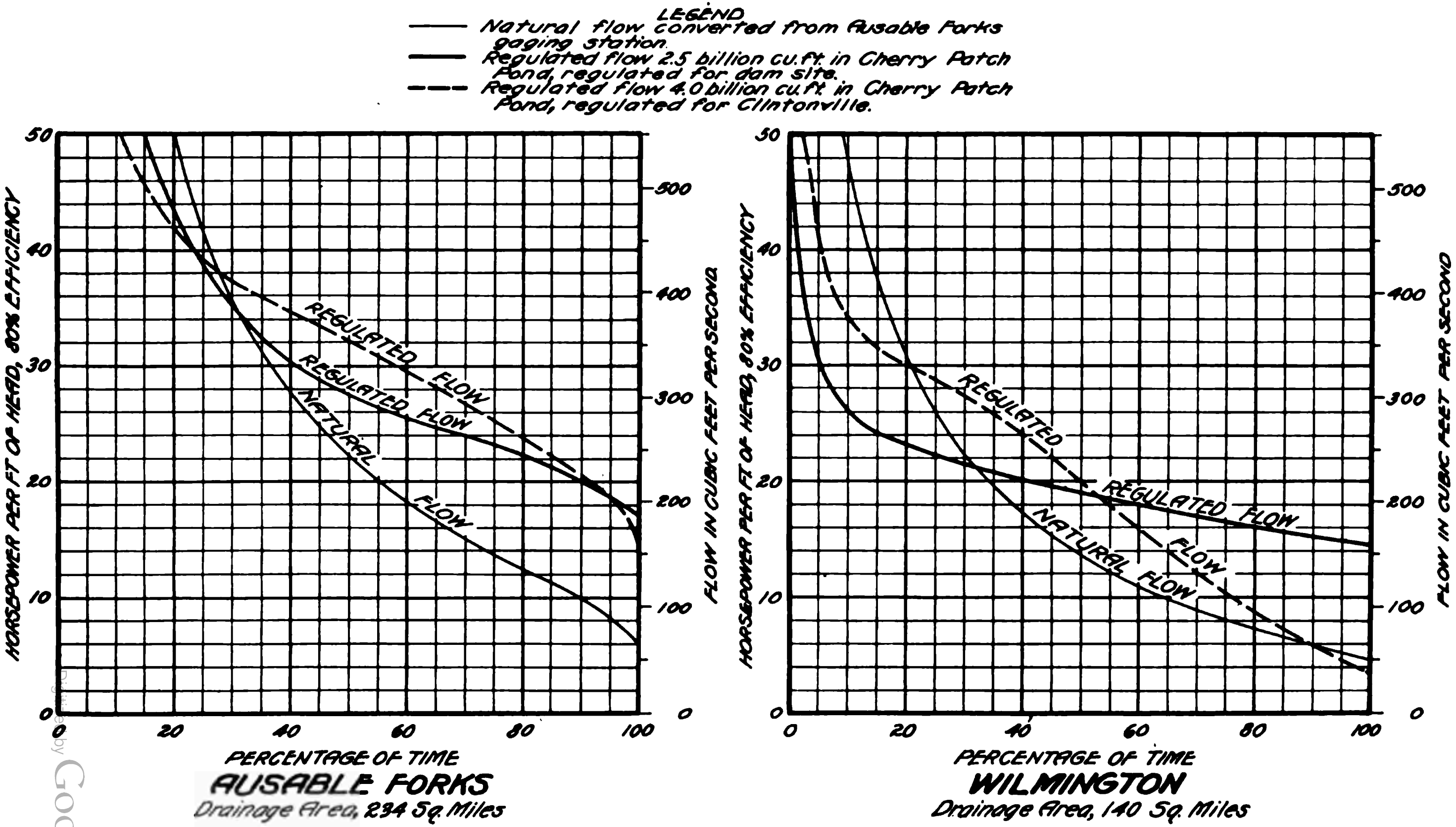

AUSABLE FORKS
Drainage Area, 234 Sq. Miles

WILMINGTON
Drainage Area, 140 Sq. Miles

AUSABLE RIVER WATER POWER

POWER-PERCENTAGE OF TIME CURVES—AUSABLE RIVER
(Period June 1, 1910 to May 31, 1919)

Acc. No. 10,223 File No. D510·4 CA

in this study as shown in column V since no information is available showing the amount of water used by each wheel. The information given in column I was obtained from the owners or superintendents of the mills in question. The stream flow given in columns VII and X is obtained from the records of the gaging station at Ausable Forks and is reduced for the various power sites by a direct drainage area ratio. A comparison of columns VI and VIII shows whether the present installation can operate continuously or not and column VI compared with column XI indicates the new installation required to secure the most economical development. Column XIV gives the elevations above sea level of the crests of the proposed dams for new power developments that have been outlined in this report and column XV shows the net heads that could be utilized by such dams.

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UNIV.

APPENDIX D

DURATION FLOW CURVES OF NEW YORK STATE STREAMS

DURATION FLOW CURVES OF NEW YORK STATE STREAMS

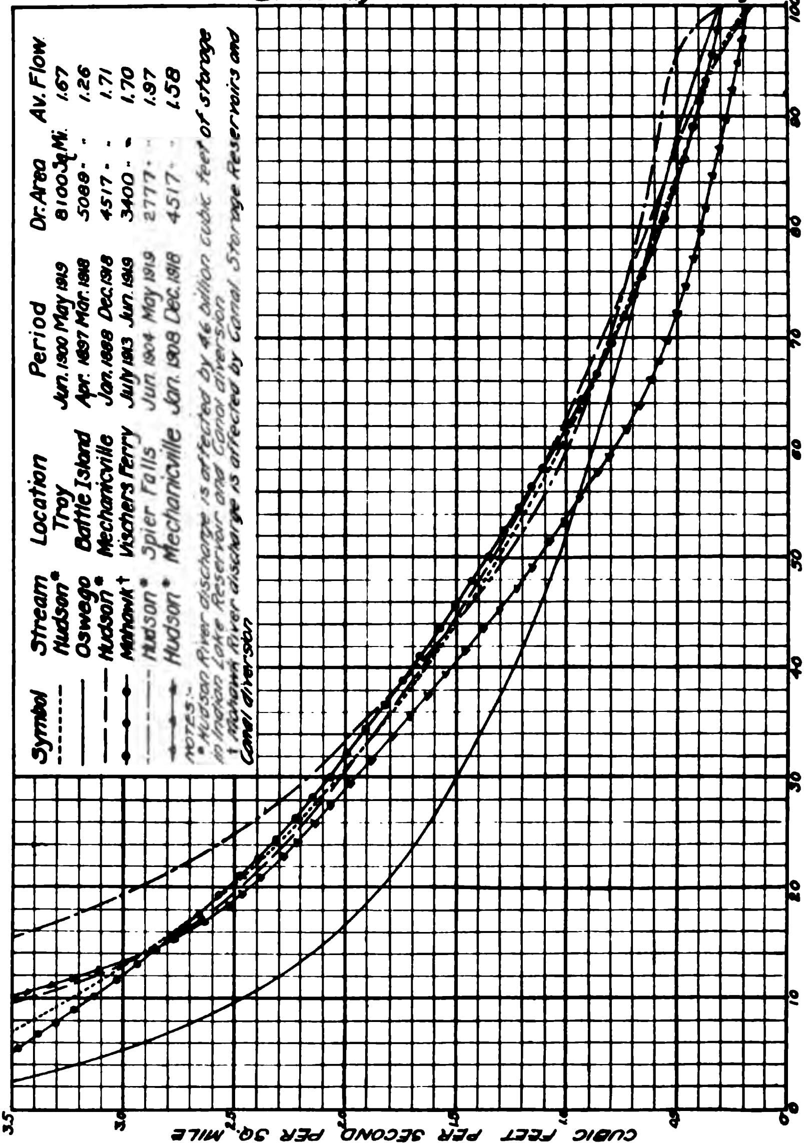
Perhaps the best way of comparing the flows of different rivers is by the use of duration flow curves. It is felt that engineers, working along hydraulic lines, will be interested in the accompanying plates on which have been plotted duration flow curves for many of the streams of the State for which there are available fairly long term stream flow records. These curves have been computed using the mean monthly flows. Elsewhere in this report will be found a number of duration flow curves which have been computed and plotted using both the daily and the mean monthly flows respectively.

It may not be amiss to give a description of the method of computing and plotting duration flow curves. The duration flow curve of a stream at a certain point shows graphically the percentage of time of the period under consideration during which any given flow was available at that point. These curves can be computed and plotted either for the natural flow or for the flow which would result from the regulation due to storage reservoirs. The ordinates of the natural flow duration curve are obtained by arranging in the order of magnitude the streams flow values in cubic feet per second for the whole period during which records are available. There have not been used in this period, however, fractions of years, for it is considered that if a fairly long term record is available and is used, the resulting curve represents the flow for an "average year." The corresponding abscissas are obtained by computing the percentage of the period involved during which the flow has been equal to or greater than any given flow. The smooth curve drawn through these points is the natural flow duration curve of the stream for that point at which the records were obtained. The regulated flow duration curve can be determined in the same manner by substituting the computed regulated flow values for the natural flow values.

The duration flow curves on the accompanying diagrams have been computed on a one square mile basis by dividing the flows in cubic feet per second by the drainage area at the point of

STATE OF NEW YORK
CONSERVATION COMMISSION
DIVISION OF WATERS
DURATION CURVES OF NEW YORK STATE STREAMS SHOWING MEASURED FLOW

Submitted by .... Sr. Asst. Engr. Approved by .... Div. Engr.



Computed by C H Hurley
Drawn by J L Quinlan

Nov. 30, 1920

FILE No. D502.4223 ACC. No. 10,838
Diagram 1 of 6 Diagrams

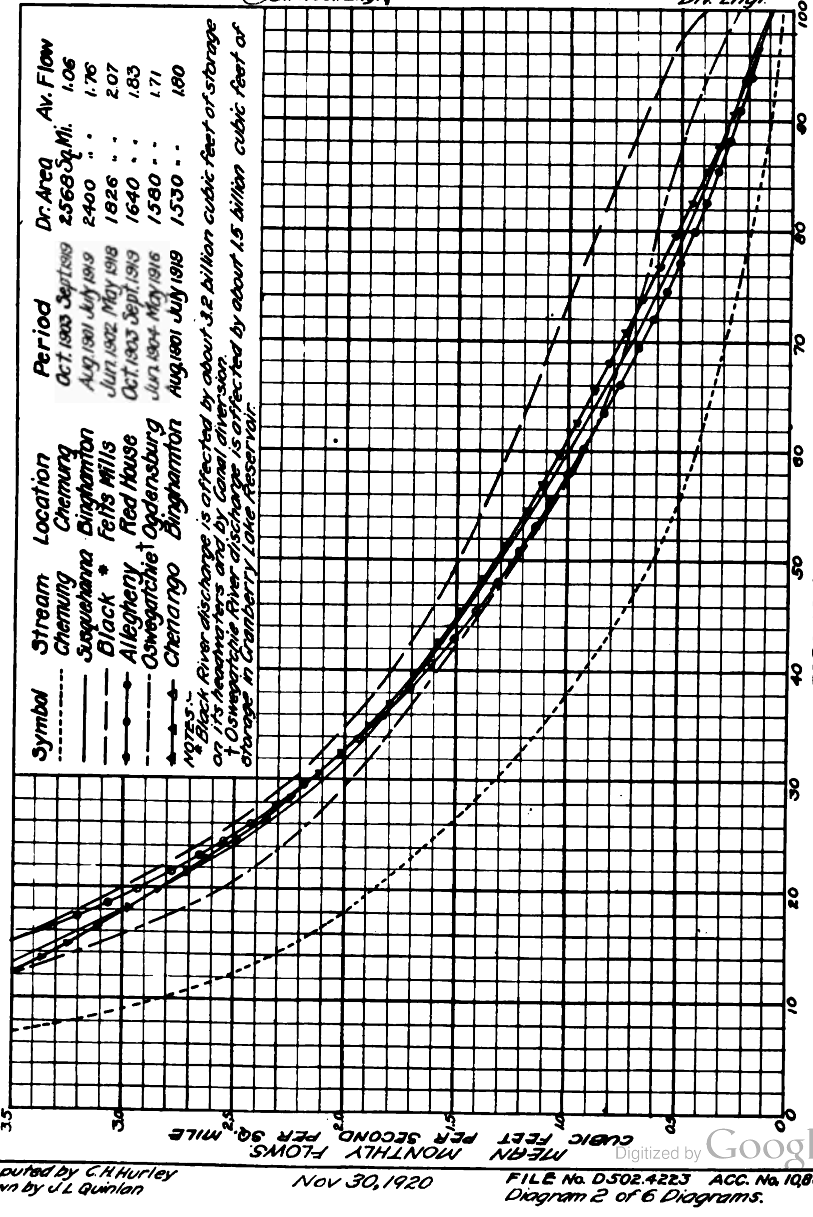
STATE OF NEW YORK

CONSERVATION COMMISSION

DIVISION OF WATERS

DURATION CURVES OF NEW YORK STATE STREAMS
SHOWING MEASURED FLOW

Submitted by F.H. Sargent . Approved by A.H. Perkins
Sr. Asst. Engr. Div. Engr.



Symbol	Stream	Location	Period	Dr. Area	Av. Flow
- - - - - - -	Chemung	Chemung	Oct. 1903 Sept. 1919	2568 Sq. Mi.	1.06
———	Susquehanna	Binghamton	Aug. 1901 July 1919	2400 " "	1.76
— — —	Black *	Felts Mills	Jun. 1902 May 1918	1826 " "	2.07
—●—●—	Allegheny	Red House	Oct. 1903 Sept. 1919	1640 " "	1.83
—·—·—	Oswegatchie †	Ogdensburg	Jun. 1904 May 1916	1580 " "	1.71
—▲—▲—	Chenango	Binghamton	Aug. 1901 July 1919	1530 " "	1.80

NOTES:–
* Black River discharge is affected by about 3.2 billion cubic feet of storage on its headwaters and by Canal diversion.
† Oswegatchie River discharge is affected by about 1.5 billion cubic feet of storage in Cranberry Lake Reservoir.

Computed by C.H. Hurley
Drawn by J.L. Quinlan

Nov 30, 1920

FILE No. D502.4223 ACC. No. 10,897
Diagram 2 of 6 Diagrams.

record. This affords a ready comparison of the characteristics of the various streams. The curves have been arranged on the diagrams generally by the size of the respective drainage areas rather than by contiguity, because the difference in their regimen of flow is thus better accentuated.

The stream flow records, on which these duration flow curves are based, are published in the hydrographic sections of the Annual Reports of the Conservation Commission and of the State Engineer and Surveyor and in the Water Supply Papers of the United States Geological Survey. In these reports are given descriptions of the topography, geology, and hydrology of the watersheds of the streams for which flow records are given. In many cases there is also given information from which can be estimated the accuracy and reliability of the record. In the power and storage reports issued by the Conservation Commission can be found more complete information regarding the rivers of the State.

There is given on the diagrams the periods for which the various duration curves were computed. Inasmuch as these periods are not identical in all cases the curves are not strictly comparable. Below will be found further data regarding the flow records which were used as a basis in the computations.

DIAGRAM No. 1

Hudson River at Troy. The values from which the duration curve of the Hudson river at Troy has been plotted represent the sum of the mean monthly flows of the Hudson and Mohawk rivers. The flow values for the Hudson river were obtained by correcting the values for the gaging station at the West Virginia Pulp and Paper Company dam at Mechanicville for canal diversion and for the effects of Indian lake storage, and from this computed natural flow, 300 cubic feet per second have been deducted from May 1st to November 30th to allow for Barge canal lockage. For the Mohawk river values the published records of the Dunsbach Ferry gaging station were used for the period from June, 1900, to December, 1910, and the records of the Vischer Ferry station from July, 1913, to May 31, 1919. The Tribes Hill gaging station records were used for the years 1911 and 1912 and for filling in breaks in the Dunsbach Ferry records. The Crescent gaging station records were used to supplement the Vischer Ferry records when necessary.

Oswego River at Battle Island. The data from which the curve designated as the Oswego river at Battle Island has been plotted, have been compiled from the published records of the High Dam gaging station near Oswego, for

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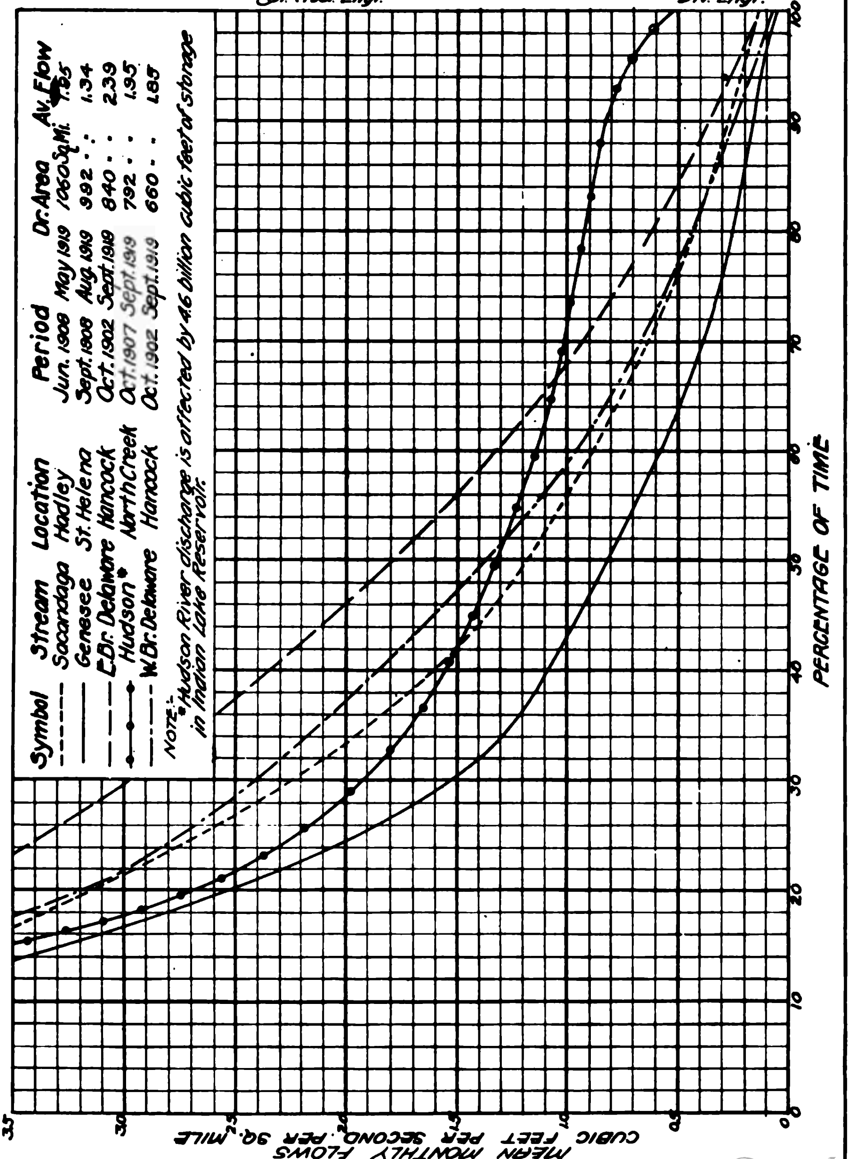
DIVISION OF WATERS
DURATION CURVES OF NEW YORK STATE STREAMS
SHOWING MEASURED FLOW

Submitted by .... St. Asst. Engr. Approved by .... Div. Engr.



Computed by C.H. Hurley
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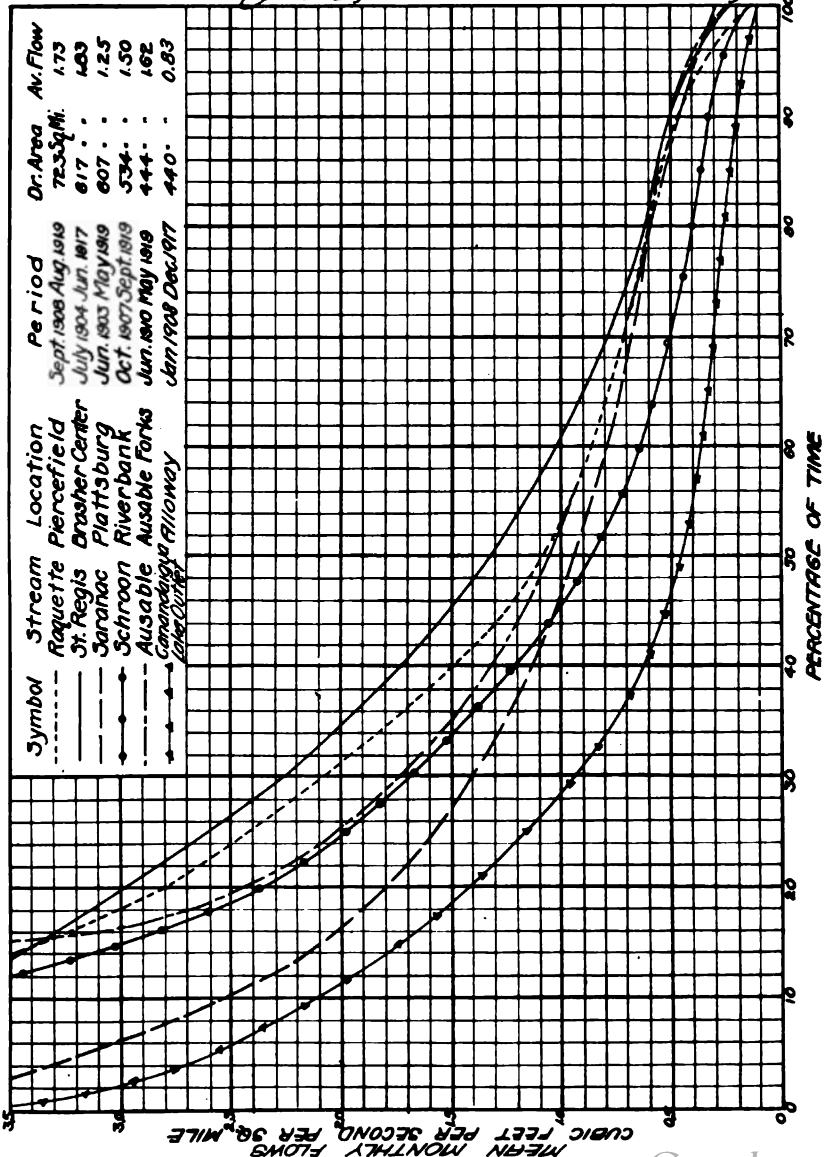
Nov. 30, 1920

FILE No. D502.4223 ACC. No. 10,693
Diagram 3 of 6 Diagrams

STATE OF NEW YORK
CONSERVATION COMMISSION
DIVISION OF WATERS
DURATION CURVES OF NEW YORK STATE STREAMS SHOWING MEASURED FLOW

Submitted by .... 1st Asst Engr Approved by .... Div Engr



Computed by C. H. Hurley
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Nov. 30, 1920

FILE No. D 302.4223 ACC. No. 10,900
Diagram 4 of 6 Diagrams

the period from April, 1897, to August, 1900; the Battle Island gaging station near Fulton, for the period from September, 1900, to December, 1913, and the Minetto gaging station from January, 1915, to March, 1918. The published records of the gaging stations on the Seneca river at Baldwinsville, the Oneida river at Euclid, and Caughdenoy and the Oswego river at the New High Dam near Oswego have been used to fill in the breaks in the records of the above mentioned stations.

Hudson River at Mechanicville. The two duration curves of the Hudson river at Mechanicville shown on Diagram No. 1, represent the computed natural flow of the stream. The values were obtained from the published records of the West Virginia Pulp and Paper Company gaging station by applying a correction to the mean monthly flow values to eliminate the effects of canal diversion and the regulation due to the Indian Lake storage.

It will be noted that the curve representing the short term period, 1908 to 1918, falls considerably below the curve for the long term period, 1888 to 1918. This difference may be explained, at least in part, by the much greater effect of the four so-called dry years of 1908, 1909, 1910 and 1913 upon an 11-year period than upon a 31-year period.

It may be noted that many gaging stations throughout the State were established about the year 1908 so that by making a comparison between the long term curve and the short term curve of the Hudson river at Mechanicville an estimate of the probable long term curve of any stream may be made when the short term curve for that stream is available.

Mohawk River at Vischer Ferry. The duration curve if the Mohawk river at Vischer Ferry has been compiled from the records of the gaging station at Vischer Ferry supplemented when necessary by records of the gaging station at Crescent.

Hudson River at Spier Falls. The duration curve designated as the Hudson river at Spier Falls has been compiled from the published records of the gaging station at Corinth for the period from June, 1904, to September, 1907. For the period from October, 1907, to October, 1912, the sums of the flows of the Sacandaga river at Hadley and the Hudson river at Thurman plus the estimated run-off from the intervening watershed, were used, except during the winter months when the Corinth records were used. The Spier Falls gaging station records were used from November, 1912, to May, 1919.

As the Spier Falls gaging station, on account of its location, is considered one of the most important in the State the period represented by the curve has been extended back prior to the date of the establishment of the Spier Falls station so as to include the known so-called dry period from 1908 to 1910, and the wet period from 1904 to 1907, in order that the curve may be fairly representative of the probable long term flow at this point.

DIAGRAM NO. 2

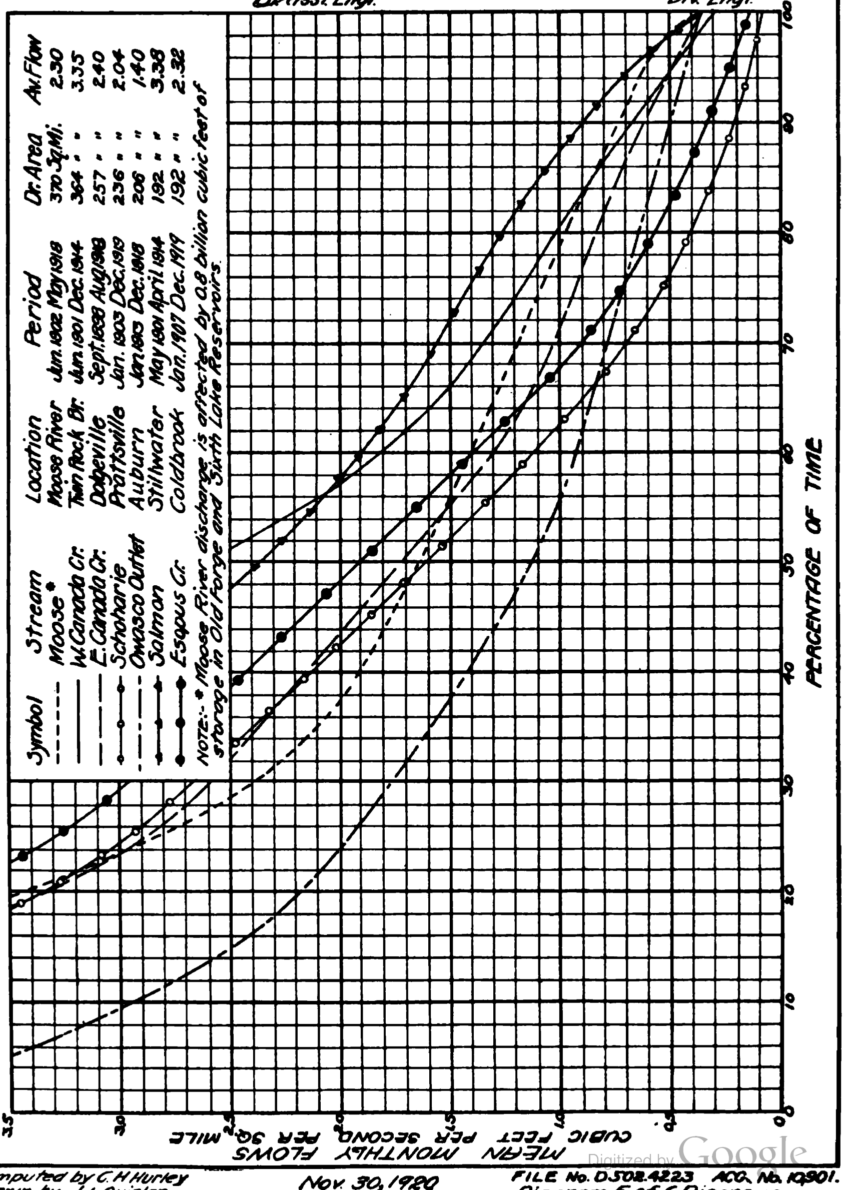
Chemung River at Chemung. The duration curve of the Chemung river at Chemung has been compiled from the published records of this station using a drainage area of 2,440 square miles. A later determination of the drainage area indicates that 2,568 square miles is a more correct value, but owing to the slight difference the change would make in the curve, and the still existing uncertainty as to the true drainage area on account of the lack of

STATE OF NEW YORK

CONSERVATION COMMISSION
DIVISION OF WATERS

DURATION CURVES OF NEW YORK STATE STREAMS SHOWING MEASURED FLOW

Submitted by .... Approved by ....
Dr. Asst Engr. Div. Engr.



Computed by C.H.Hurley
Drawn by J.L.Quinlan

Nov. 30, 1920

FILE No. D502.4223 ACC. No. 10301.
Diagram 5 of 6 Diagrams

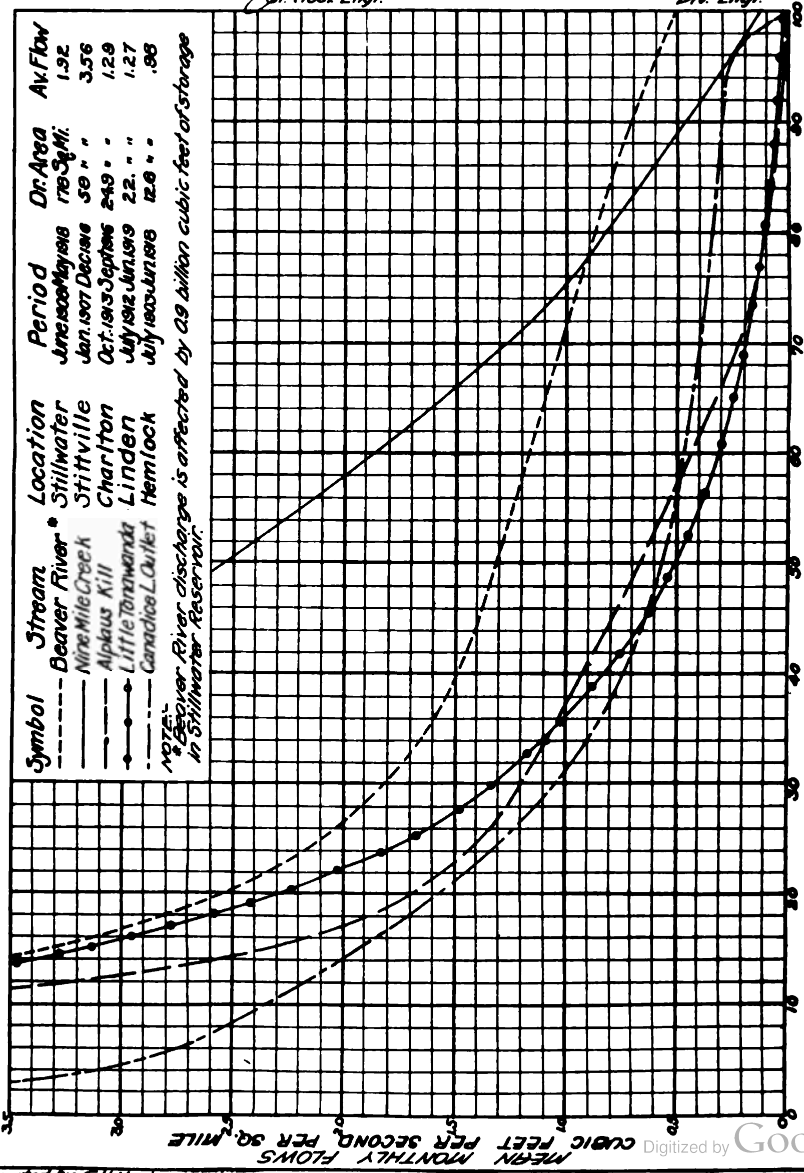
STATE OF NEW YORK

CONSERVATION COMMISSION

DIVISION OF WATERS

DURATION CURVES OF NEW YORK STATE STREAMS SHOWING MEASURED FLOW

Submitted by .... Approved by ....
Jr. Asst Engr. Div. Engr.



Computed by C. H. Hurley
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Nov. 30, 1920

FILE No. D 502.4223 ACC. No. 10,808
Diagram 6 of 6 Diagrams.

United States Geological Survey sheets for a considerable portion of the drainage area, the curve was not changed to conform with the drainage area of 2,568 square miles.

Susquehanna River at Binghamton. The duration curve of the Susquehanna river at Binghamton represents the flow above its junction with the Chenango river. The published records of the gaging station at Binghamton were used for the period from August, 1901, to December, 1912, and the records for the gaging station near Conklin for the period from January, 1913, to July, 1919. Breaks in the records of these stations were filled in by conversion from the records of the east or west branches of the Delaware river or from the Chenango river.

Black River at Felts Mills. The duration curve of the Black river at Felts Mills has been compiled from the published records of the gaging station at Felts Mills for the period from August, 1902, to March, 1917, and of the Black River village gaging station from April, 1917, to May, 1918. Breaks in the above records have been filled in by conversion from the records of the gaging station on the Moose river at Moose River.

Allegheny River at Red House. The duration curve of the Allegheny river at Red House has been compiled from the published records of the gaging station at that place.

Oswegatchie River at Ogdensburg. The duration curve of the Oswegatchie river at Ogdensburg represents the flow at the Eel Weir bridge gaging station a short distance above Ogdensburg.

Chenango River at Binghamton. The duration curve of the Chenango river at Binghamton has been compiled from the published records of the gaging station at Binghamton for the period from August, 1901, to December, 1912, and records of the Chenango Forks gaging station from January, 1913, to July, 1919. Missing records of these stations were filled in by conversion from records of flow of the Susquehanna river.

DIAGRAM No. 3

Sacandaga River at Hadley. The duration curve of the Sacandaga river at Hadley has been compiled from the published records of the upper bridge gaging station for the period from June, 1908, to December, 1910, and from the records of the present station about a mile farther down stream for the period from January, 1911, to May, 1919.

Genesee River at St. Helena. The duration curve of the Genesee river at St. Helena has been compiled from the published records of the St. Helena gaging station.

East Branch Delaware River at Hancock. The duration curve designated as the East branch, Delaware river at Hancock, has been compiled from the records of the gaging station at Hancock for the period from October, 1902, to December, 1912, and from the records of the station at Fish Eddy about four miles up-stream for the period from January, 1913, to September, 1919.

Hudson River at North Creek. The duration curve of the Hudson river at North Creek has been compiled from the published records of the North Creek gaging station.

West Branch, Delaware River, at Hancock. The duration curve designated as West branch, Delaware river, at Hancock has been compiled from the published records of the gaging station at Hancock for the period from October, 1902, to December, 1912, and from the station at Hales Eddy about seven miles up-stream from January, 1913, to September, 1919.

DIAGRAM NO. 4

Raquette River at Piercefield. The duration curve of the Raquette river at Piercefield has been compiled from the published records of the Piercefield gaging station.

St. Regis River at Brasher Center. The duration curve of the St. Regis river at Brasher Center has been compiled from the published records of the gaging station at that place.

Saranac River near Plattsburg. The duration curve of the Saranac river near Plattsburg has been compiled from the published records of the gaging station near Plattsburg.

Schroon River near Riverbank. The duration curve of the Schroon river near Riverbank has been compiled from the published records of the gaging station at this place.

Ausable River at Ausable Forks. The duration curve of the Ausable river at Ausable Forks represents the flow below the junction of the east and west branches of the Ausable river and has been compiled from the published records of the Ausable Forks gaging station.

Canandaigua Outlet at Alloway. The duration curve of the Canandaigua Outlet at Alloway has been compiled from the published records of the gaging station at Alloway. Missing records have been filled in by conversion from the records of the Owasco Outlet at Auburn gaging station.

DIAGRAM NO. 5

Moose River at Moose River. The duration curve of the Moose river at Moose River has been compiled from the records of the gaging station near Moose River village. Missing records have been filled in by conversion from the records of the Felts Mills gaging station.

West Canada Creek at Twin Rock Bridge. The duration curve designated as West Canada creek at Twin Rock bridge has been compiled from the published records of the Twin Rock bridge gaging station for the period from January, 1901, to December, 1909, and from the records of the Wilmurt gaging station from January, 1910, to December, 1914. Missing records have been filled in by conversion from the Trenton Falls gaging station records.

East Canada Creek at Dolgeville. The duration curve of East Canada creek at Dolgeville has been compiled from the Dolgeville gaging station records.

Schoharie Creek at Prattsville. The duration curve of the Schoharie creek at Prattsville has been compiled from the published records of the gaging station at Prattsville.

Owasco Outlet near Auburn. The duration curve of Owasco Outlet near Auburn has been compiled from the published records of the gaging station near Auburn.

Salmon River at Stillwater. To compile the duration curve of the Salmon river at Stillwater bridge near Redfield a computed flow based on the published records of the gaging stations of the Salmon river at Pulaski, the Black river at Felts Mills and West Canada creek at Twin Rock bridge have been used for the period from May, 1901, to June 1911. For the period from July, 1911, to November, 1913, the records of the Salmon River Power Company gaging station at Stillwater bridge were used and for the remaining portion of the period December, 1913, to April, 1914, the flow was converted from the records of West Canada creek gaging stations at Trenton Falls and Poland.

Esopus Creek at Coldbrook. The duration curve designated as Esopus creek at Coldbrook has been compiled from the published records of the Olive Bridge gaging station for the period from January, 1907, to December, 1913, and of the Coldbrook gaging station for the period from January, 1914, to December, 1919.

DIAGRAM NO. 6

Beaver River at Stillwater. The duration curve of the Beaver river at Stillwater has been compiled from the published records of the gaging station at the Stillwater reservoir dam.

Nine Mile Creek near Stittville. The duration curve of Nine Mile creek near Stittville hase been compiled from the published records of the gaging station at Powell's bridge near Stittsville.

Alplaus Kill near Charlton. The duration curve of Alplaus kill near Charlton has been compiled from the published records of the gaging station which was maintained at this point from 1913 to 1916.

Little Tonawanda Creek at Linden. The published records of the gaging station at Linden provide the data from which the duration curve of Little Tonawanda creek at Linden has been compiled.

Canadice Lake Outlet at Hemlock. The duration curve of Canadice lake outlet at Hemlock has been compiled from the published records of this gaging station.

A comparison of this curve with the curves showing the flows of Alplaus kill near Charlton and Little Tonawanda creek at Linden shows very plainly the effect of a fair degree of storage upon the low water flow of small streams. Canadice lake outlet discharge is affected by storage in Canadice lake and there is no artificial storage and very little natural storage on the watersheds of Alplaus kill and Little Tonawanda creek.

STREAM FLOW STUDIES

The water power and storage tables and estimates given in the pamphlets and reports of the Commission have almost entirely been based on duration curves computed and plotted using the mean monthly flows of the various rivers of the State. The engineers of the Commission have often been asked why daily flows were not used instead of the mean monthly flows. There are two reasons: first, the great increase in computations that duration curves computed from daily flows require; second, tables accompanying the reports of the power and storage possibilities of the various rivers have been prepared largely to show the benefits from storage and the Commission's engineer's have determined that the apparent benefit from storage is greater when daily natural and regulated flows are used than when monthly flow curves are used. This means that the Commission's estimates, based on mean monthly flows, are conservative.

However, it is felt that many engineers and others, perhaps, will be interested in a comparison of duration curves plotted from daily and monthly flows respectively. There are shown on the accompanying plates such duration curves of several rivers which it is believed well typify the streams of the State. It may be noted that the difference between the daily and monthly flow curves is greater on the Genesee river, a "flashy" stream, than on Owasco Lake Outlet, a stream with considerable natural storage. On the plate of the Sacandaga river at Hadley has been plotted in addition to the daily and monthly curves for natural flow similar curves showing the effect of the regulation of the proposed Sacandaga reservoir. On this plate it may be noted that the area between the natural and regulated daily flow curves is somewhat greater than the area between the corresponding curves plotted from the mean monthly flow values.

STATE OF NEW YORK

CONSERVATION COMMISSION

DIVISION OF WATERS

COMPARATIVE DURATION CURVES OF SACANDAGA RIVER AT HADLEY

Submitted by .... Approved by ....
Sr. Asst. Engr. Div. Engr.

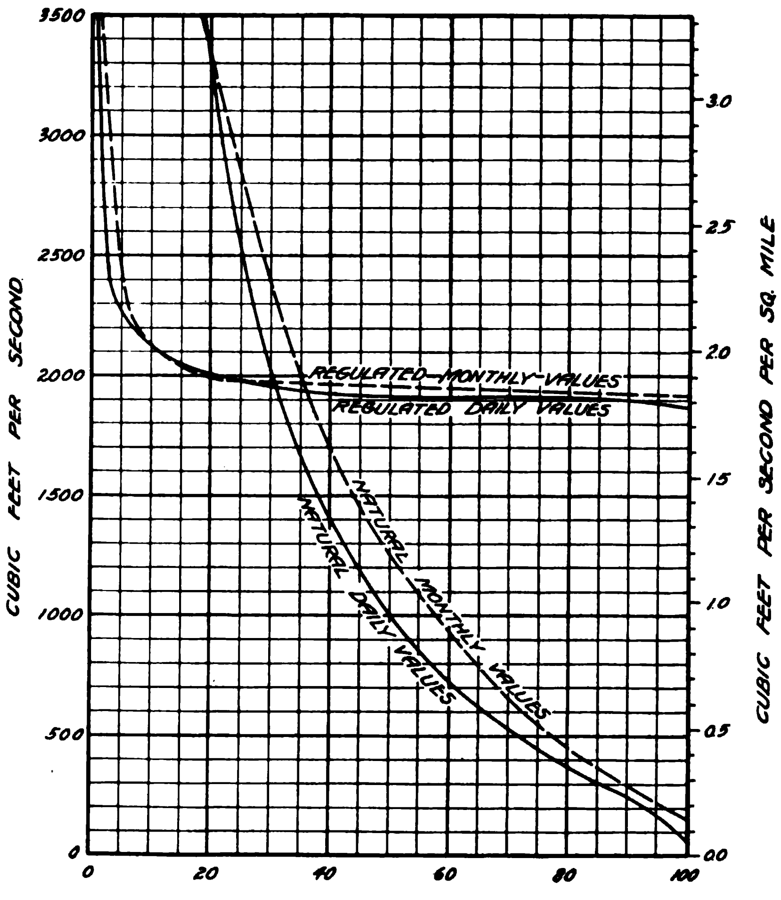
Notes;-

Curves compiled from mean monthly and mean daily flow values, Period June 1, 1908 to May 31, 1919 = 132 months = 4015 days

Drainage area = 1060 square miles

Average flow = 2061 cu. ft. per second = 1.95 cu. ft. per second per square mile.

Regulation due to 30 billion cu. ft. of storage, regulated for Hadley.



Computed by C.H. Hurley
Drawn by W.E. Stahl

Nov. 30, 1920

File No. D502.4223HS Acc. No. 9989

STATE OF NEW YORK

CONSERVATION COMMISSION

DIVISION OF WATERS

COMPARATIVE DURATION CURVES OF HUDSON RIVER AT SPIER FALLS

Submitted by .... Approved by A.H. Perkins ....
St. Asst. Engr. Div. Engr.

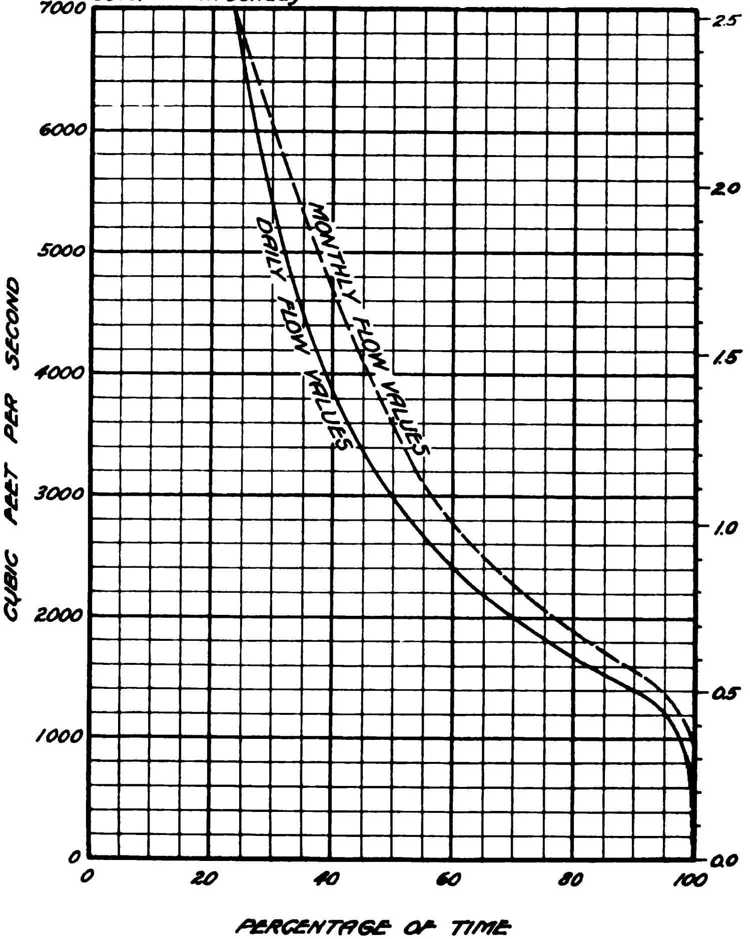
Notes;-

Curves compiled from mean monthly and mean daily flow values. Period June 1, 1904 to May 31, 1919 = 180 months = 5478 days.

Drainage area = 2777 square miles.

Average flow = 5480 cu. ft. per second = 1.97 cu. ft. per second per square mile.

Monthly flow values affected by storage at Indian Lake Reservoir. Daily flow values affected by storage at Indian and pondage at Spier Falls. Extremely low daily flows occurred on sunday



Computed by C.H. Hurley
Drawn by W.E. Stahl

Nov. 30, 1920

File No. D502-4223 HSp Acc No 9991

STATE OF NEW YORK

CONSERVATION COMMISSION

DIVISION OF WATERS

COMPARATIVE DURATION CURVES OF GENESEE RIVER AT ST HELENA

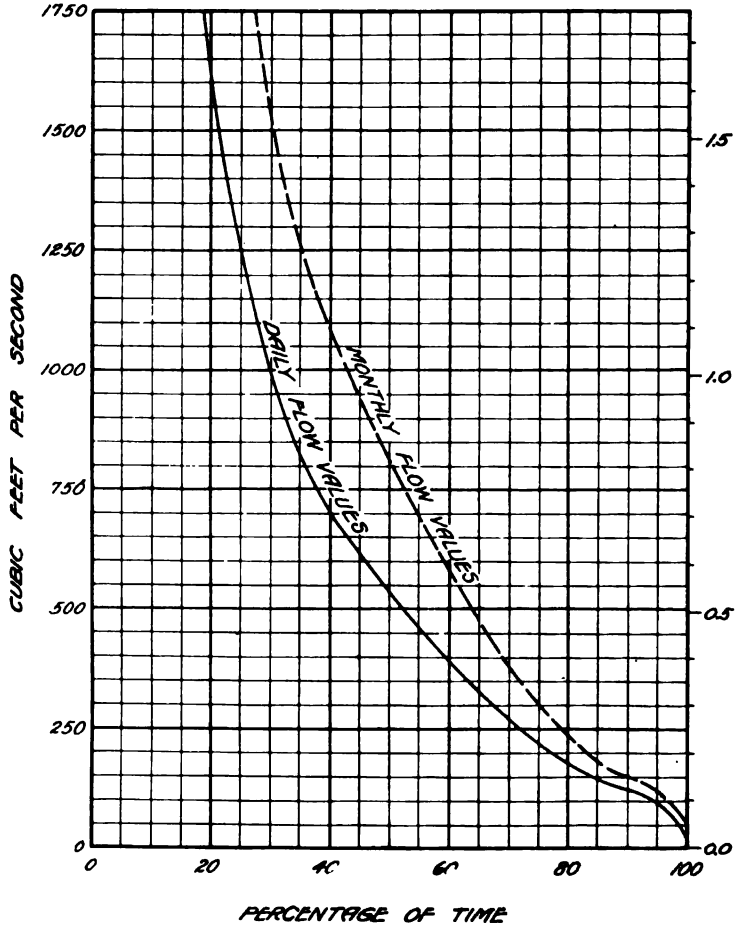
Submitted by .... Approved by ....
Sr Asst Engr Div. Engr.

Notes;-
Curves compiled from mean monthly and mean daily flow values. Period Sept. 1, 1908 to Aug. 31, 1919 = 132 months = 4017 days.

Drainage area = 992 square miles.

Average flow = 1330 cu. ft. per second = 1.34 cu. ft. per second per square mile.

Daily flow values slightly affected by pondage at Portage



Computed by C.H. Hurley
Drawn by W.E. Stahl.

Nov. 30, 1920

File No D502-42236 Acc No 9992

STATE OF NEW YORK

CONSERVATION COMMISSION

DIVISION OF WATERS

COMPARATIVE DURATION CURVES OF BLACK RIVER AT FELTS MILLS

Submitted by .... Approved by A.H. Perkins
Sr. Asst. Engr. Div. Engr.

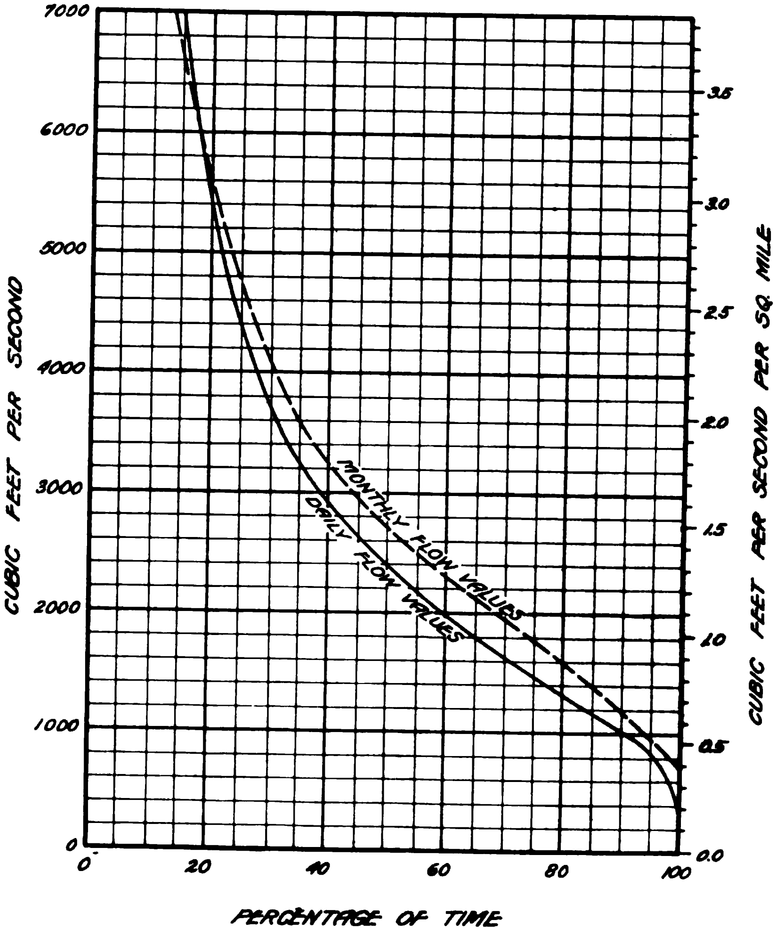
Notes;-

Curves compiled from mean monthly and mean daily flow values. Period June 1, 1911 to May 31, 1918 = 84 months = 2555 days.

Drainage area = 1826 square miles.

Average flow = 3780 cu. ft. per second = 2.07 cu. ft. per second per square mile

Both daily and monthly flows affected by storage and canal diversion. Daily flows affected by pondage.



Computed by C.H. Hurley.
Drawn by W.E. Stahl.

Nov. 30, 1920 File No. D502-1223 B Acc. No 9990

STATE OF NEW YORK

CONSERVATION COMMISSION

DIVISION OF WATERS

COMPARATIVE DURATION CURVES OF OWASCO OUTLET NEAR AUBURN

Submitted by E. H. Sargent Sr. Asst. Engr. Approved by A. H. Perkins Div. Engr.

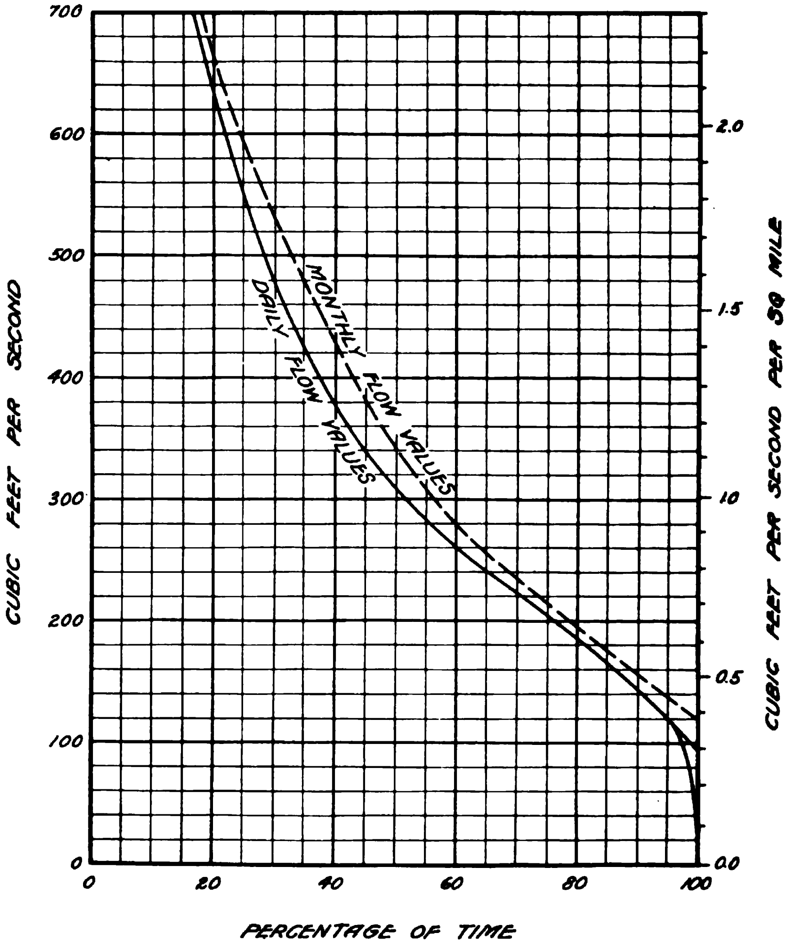
Notes;-

Curves compiled from mean monthly and mean daily flow values, Period Jan. 1, 1913 to Dec 31, 1918 = 72 months = 2191 days

Drainage area = 206 square miles.

Average flow = 302 cu. ft per second = 1.47 cu. ft per second per square mile.

Daily flows affected by pondage. Extremely low daily flows occurred on sunday.



Computed by G.H. Hurley
Drawn by W.E. Stahl.

Nov. 30, 1920

File No. D502-12230a Acc. No 9993

APPENDIX E

MAXIMUM AND MINIMUM FLOWS OF STREAMS IN NEW YORK STATE

MAXIMUM AND MINIMUM FLOW OF STREAMS IN NEW YORK STATE

Watershed	Stream	Station	Drainage area sq. miles	Maximum Flow		Minimum Flow		Period for which records are available	Remarks
				C. F. S. per sq. mile	Date	C. F. S. per sq. mile	Date		
Allegheny	Allegheny river	Red House	1,640.	24.4	Mar. 26, 1913	.061	Dec. —, 1908	1903——	
Black	Black river	Boonville	303.	*33.0	Mar. 28, 1913	......	....	1911——	Diversion reservoirs above gaging sta.
Black	Black river	Felts Mills	1,851.	est. 17.4	Mar. 28, 1913	......	....	1902–1917	Flow affected by pondage and reservoirs
Black	Black river	Black river	1,870.	*10.3	April 4, 1917	.009	June 29, 1917	1917——	Flow affected by pondage and reservoirs.
Black	Beaver river	Croghan	274.	24.8	Mar. —, 1903	.109	Sept. —, 1901	1901–1903	Reservoir above gaging station.
Black	Beaver river	Beaver river	178.	18.7	May 2, 1911	......	....	....	Station at Stillwater reservoir.
Black	Moose river	Moose river	370.	*44.6	Mar. 27, 1913	.114	July —, 1913	1900——	Flow affected by pondage and reservoirs.
Black	Moose river	Old Forge	51.5	14.8	Mar. 28, 1913	.505	Aug.-Sept.'19	1911——	800 mil. cu. ft. storage.
Chemung	Chemung river	Chemung	2,440.	27.5	Mar. 15, 1918	.020	Aug. 14, 1911	1903——	Minimum flow of doubtful accuracy.
Chemung	Mud creek	Savona	80.	*10.6	May 23, 1919	*.050	Sept. 30, 1919	1918——	Max. and min. disch. affected by storage.
Chemung	Cohocton river	Campbell	480.	*19.3	May 23, 1919	*.058	Sept. 30, 1919	1918——	
Chemung	Tioga river	Erwin	1,320.	*	May 22, 1919	.053	Aug. —, 1918	1918——	Max. stage beyond limits of present rating curve.
Champlain	Ausable river	Ausable Forks	444.	*56.3	Mar. 27, 1913	.000	July 21, 1912	1910——	Flow affected by pondage.
Champlain	Bouquet river	Willsboro	272.	....	....	.085	....	....	Low water season, 1908.
Champlain	Chazy river	Mooers	202.6	....	....	.084	....	....	Low water season, 1908.
Champlain	Lake George outlet	Ticonderoga	220.	3.0	....	.055	....	1904——	Storage in Lake George.
Champlain	Richelieu river	Ft. Montgomery	7,750.	5.6	....	.448	....	1875——	Monthly records only, 1875–1899.
Champlain	Saranac river	Plattsburg	607.	10.55	April 20, 1914	.148	Sept. 28, 1914	1903——	Flow affected by pondage.
Champlain	Saranac river	Saranac lake	185.	....	....	.282	....	....	Low water season, 1903.
Delaware	E. br. Delaware riv.	Hancock	840.	86.3	....	.064	....	1902–1912	Max. flow of very doubtful accuracy.
Delaware	E. br. Delaware riv.	Fish Eddy	790.	42.4	Mar. 27, 1913	.123	Oct. —, 1914	1912——	
Delaware	W. br. Delaware riv.	Hancock	660.	51.1	....	.032	....	1902–1912	
Delaware	W. br. Delaware riv.	Hale Eddy	611.	40.9	Mar. 27, 1913	.056	Sept. 21, 1913	1912——	
Delaware	Delaware river	Port Jervis	3,250.	28.5	Mar. 28, 1914	.054	Sept. 22-23,'08	1904——	
Delaware	Mongaup river	Rio	189.	17.8	....	.132	....	1906–1913	
Delaware	Beaver Kill	Cooks Falls	236.	41.1	Oct. 30, 1917	.127	Oct. 12, 1916	1913——	
Erie-Niagara	Cattaraugus creek	Versailles	467.	*64.2	Mar. 25, 1913	.105	Aug. —, 1918	1910——	
Erie-Niagara	Little Tonawanda cr.	Linden	22.	*114.0	May 10, 1919	.020	Aug.-Oct. '13	1912——	
Erie-Niagara	Niagara river	Buffalo	254,708.	1.01	....	.662	....	1860——	Monthly values.

Genesee	Canaseraga creek	Cumminsville	160.	*40.9	May 22, 1919	.131	Sept. —, 1919	1917——	
Genesee	Canaseraga creek	Dansville	158.	*42.4	May 16, 1916	.095	Oct., Nov. '16	1910-12, 15-17	Record not complete.
Genesee	Canadice lake outlet	Hemlock	12.6	....	....	......	....	1903——	Only monthly flows available.
Genesee	Genesee river	Jones Bridge	1,400.	39.3	May 17, 1916	.013	Aug. 29, 1909	1903-06, 08-13, 15	Min. discharge affected by storage.
Genesee	Genesee river	Rochester	2,440.	19.8	Mar. 30, 1916	.045	July —, 1918	1904-1918	Min. discharge affected by storage.
Genesee	Genesee river	St. Helena	992.	*44.6	May 17, 1916	*.018	Oct. —, 1913	1908——	Min. discharge affected by storage.
Genesee	Genesee river	Scio	288.	*36.8	May 22, 1919	*.087	July 20, 1919	1916——	
Genesee	Honeoye creek	East Rush	238.	11.5	....	.050	....	1903-06	Flow affected by storage and pondage.
Genesee	Keshequa creek	Sonyea	69.	*86.2	May 22, 1919	.010	Aug. 20, 1918	1910-12, 15——	
L. Hudson	Beaver Kill	Brown Station	17.	35.3	Nov. 10, 1913	.060±	Several	1907-13	
L. Hudson	Catskill creek	Oak Hill	97.	*127.0	Nov. 9, 1913	*.010±	Several	1910——	
L. Hudson	Croton river	New Croton dam	375.8	....	....	......	....	1868——	Monthly values only.
L. Hudson	Esopus creek	Mt. Marion	368.	*75.5	April 26, 1910	*.073	Sept. 1, 1907	1907-1913	
L. Hudson	Esopus creek	Olive Bridge	239.	*117.7	April 26, 1910	*.075	Sept. 16-17, '08	1903-04-06-13	
L. Hudson	Esopus creek	Coldbrook	192.	111.5	Nov. 9, 1913	.042	Oct. 14, 1914	1913——	
L. Hudson	Fishkill creek	Glenham	198.	69.2	Mar. 1, 1902	.202	Sept. 4, 1902	1901-1903	
L. Hudson	Kinderhook creek	East Nassau	120.	....	....	......	....	1892-1893	Low water flows only.
L. Hudson	Kinderhook creek	Rossman	331.	30.8	Feb. 20, 1909	......	....	1906-1914	Flow affected by pondage.
L. Hudson	Mianus river	Bedford	10.68	13.5	Mar. 24, 1903	.131	May 23, 1903	1903——	
L. Hudson	Normanskill creek	French Mills	111.	....	....	.042	Sept. 29, 1891	1891——	Low water flows only.
L. Hudson	Quackenkill creek	Quackenkill	18.5	23.0	Mar. 7, 1894	.027	July 3, 1894	1894——	
L. Hudson	Rondout creek	Alligerville	345	*58.0	April 26, 1910	*.070	Aug. 23, 1911	1908-1914	
L. Hudson	Rondout creek	Lackawack	100.	*140.0	Nov. 9, 1913	*.140	Several	1910——	
L. Hudson	Rondout creek	Rosendale	386.	*51.9	Feb. 20, 1909	*.052	Aug.-Sept. '07	1901-03, 06-19	
L. Hudson	Rondout creek	Honk Falls	102.	*157.0	April 26, 1910	*.059	Several	1906-1910	
L. Hudson	Wallkill river	New Paltz	736.	32.4	Mar. 3, 1902	.095	Sept. 8, 1902	1901-1903	
L. Hudson	Wappinger creek	Wappinger Falls	194.	18.0	Mar. —, 1904	.067	Aug. —, 1904	1903-1905	
L. Hudson	Esopus creek	Kingston	317.	*70.8	Feb. 20, 1909	*.063	Sept. 17-25, '08	1907-1909	
U. Hudson	Battenkill creek	Greenwich	444.	*21.6	Mar. 28, 1913	.036	July 30, 1911	1911——	
U. Hudson	Fish creek	Burgoyne	236.	....	....	.242	Oct. —, 1908	1908——	Low water flows only.
U. Hudson	Hoosick river	Buskirk	579.	38.6	Mar. 8, 1904	......	....	1903-1910	Flow affected by pondage.
U. Hudson	Hoosick river	Eagle Bridge	512.	19.5	Mar. 27, 1913	.000	Sept. 14, 1913	1910——	Low flow practically zero
U. Hudson	Hoosick river	Johnsonville	609.	36.0	Mar. 27, 1913	......	....	1909——	Flow affected by pondage.
U. Hudson	Hoosick river	Schaghticoke	635.	39.4	Feb. 6, 1909	......	....	1909——	Flow affected by pondage.
U. Hudson	Hudson river	Corinth	2,728.	....	....	......	....	1904——	For max. and min., see Spier Falls.
U. Hudson	Hudson river	Near Indian Lake	418.	32.3	June 12, 1917	.134	Sept 11, 12, '16	1916——	
U. Hudson	Cedar river	Indian Lake	85.	43.6	May 17, 1916	.059	Sept. 27, 1915	1911-1917	
U. Hudson	Indian river	Indian Lake	132.	*26.2	Mar. 28, 1913	......	....	1900——	Flow affected by storage.
U. Hudson	Hudson river	Mechanicville	4,500.	*26.6	Mar. 28, 1913	......	....	1888——	Flow affected by pondage.
U. Hudson	Hudson river	North Creek	804.	*37.3	Mar. 27, 1913	.209	Sept. 30, 1913	1907——	Flow affected by Indian Lake storage.
U. Hudson	Hudson river	Spier Falls	2,777.	31.8	Mar. 28, 1913	*.002	Sept. 23, 1917	1912——	Flow affected by pondage.
U. Hudson	Hudson river	Thurman	1,550.	*29.7	Mar. 27, 1913	.187	Sept. 30, 1913	1907——	Flow affected by storage.
U. Hudson	W. Br. Sacandaga	Blackbridge	211.	*137.0	Mar. 27, 1913	.014	Sept. —, 1913	1911-1916	Flow affected by storage
U. Hudson	Sacandaga river	Hadley	1,060.	*33.5	Mar. 28, 1913	*.058	Sept. 15, 1913	1907——	
U. Hudson	Sacandaga river	Hope	494.	*50.2	Mar. 27, 1913	*.040	Sept. 30, 1913	1911——	Flow affected by storage.
U. Hudson	Sacandaga river	Northville	740.	29.0	April 20, 1909	.043	Sept. 20, 1909	1907-1910	
U. Hudson	Schroon river	Riverbank	534.	*25.3	Mar. 28, 1913	.052	Oct. 17, 1909	1907——	Flow affected by storage.

MAXIMUM AND MINIMUM FLOW OF STREAMS IN NEW YORK STATE—Concluded

WATERSHED	Stream	Station	Drainage area sq. miles	Maximum Flow		Minimum Flow		Period for which records are available	Remarks
				C. F. S. per sq. mile	Date	C. F. S. per sq. mile	Date		
† Mohawk	Alplaus Kill	Charlton	24.9	36.7	Mar. 28, 1913	.000	Aug. —, 1913	1913-1916	
Mohawk	Cayadutta creek	Johnstown	40.	20.3	April 13, 1899	.15c	Sept. 12, 1913	1898-1900	
Mohawk	E. Canada creek	Dolgeville	257.	56.5	Mar. 26, 1913	.000	Aug 21. 1910	1898——	Flow affected by pondage.
Mohawk	Graefenburg creek	New Hartford	0.28	53.7	Oct. 9, 1913	1.810	Dec. —, 1904	1903-1906	Fed by springs.
Mohawk	Johnston brook	Deerfield	0.79	16.0	April 7, 1904	.152	Dec. —, 1904	1903-1905	
Mohawk	Mohawk river	Dunsbach Ferry	3,440.	24.6	Oct. 10, 1903	.116	Sept. —, 1908	1898-1910	Canal diversion.
Mohawk	Mohawk river	Fultonville Br.	2,156.	....	....	.191	Sept. 16, 1909	1906-1911	Max. beyond rating curve.
Mohawk	Mohawk river	Little Falls	1,306.	26.2	Mar. 28, 1913	......	....	1898-1913	Flow affected by pondage.
Mohawk	Mohawk river	Rexford Flats	3,385.	13.5	Feb. 14, 1900	......	....	1898-1901	Canal diversion.
Mohawk	Mohawk river	Ridge Mills	153.	26.1	Nov. 26, 1900	......	....	1898-1900	Canal diversion.
Mohawk	Mohawk river	Rocky Rift Dam	1,351.	17.2	Mar. 21, 1901	......	....	1901——	Canal diversion.
Mohawk	Mohawk river	Rome	158.	38.8	Feb. 28, 1910	.525	Feb. —, 1908	1907-1915	Flow affected by storage.
Mohawk	Mohawk river	Tribes Hill	3,113.	29.0±	Mar. —, 1913	.164	Feb. —, 1912	1904-1913	Canal diversion.
Mohawk	Mohawk river	Vischer Ferry	3,400.	41.3	Mar. 28, 1914	.085	Oct. 31, 1914	1913——	†Canal diversion. Max. record due to ice jam. Discharge uncertain.
Mohawk	Mohawk river	Crescent	3,490.	*10.9	Mar. 23, 1918	.218	Aug. 19, 1918	1917——	†Canal diversion.
Mohawk	Nine Mile creek	Stittville	59	101.6	Oct. 8, 1907	.068	Aug. —, 1916	1907-1916	Max. exceeds rating curve.
Mohawk	Reels creek	Deerfield	4.4	67.0	June —, 1903	.038	Several	1901-1904	
Mohawk	Sauquoit creek	N. Y. Mills	52.	27.2	Feb. 13, 1900	......	....	1898-1900	Flow affected by pondage.
Mohawk	Schoharie creek	Esperance	876.	*51.4	Feb. 20, 1918	.018	Aug. 28, 1907	1907——	
Mohawk	Schoharie creek	Ft. Hunter	909.	55.1	Mar. 21, 1901	......	....	1904-1911	Canal diversion.
Mohawk	Schoharie creek	Middleburg	532.	59.5	Feb. 20, 1909	.023	Sept. 14-21, '13	1906——	
Mohawk	Schoharie creek	Prattsville	236.	*118.6	Oct. 9, 1903	*.022	Aug. 3, 1913	1903——	
Mohawk	Starch Factory creek	New Hartford	3.4	186.0	Feb. 28, 1910	018	Aug. 6, 1911	1903——	Storage of 25,000,000 gallons.
Mohawk	Sylvan Glen creek	New Hartford	1.18	59.3	July —, 1905	Zero	Several	1904-1906	
Mohawk	W. Canada creek	Kast Bridge	575.	40.5	Mar. 26, 1913	.139	Sept. 12, 1913	1907——	
Mohawk	W. Canada creek	Middleville	518.	13.5	April 26, 1899	......	....	1898-1901	Flow affected by storage.
Mohawk	W. Canada creek	Poland	470.	36.8	Mar. 27, 1913	.230	Sept. 19, 1909	1908-1914	
Mohawk	W. Canada creek	Trenton Falls	376.	68.4	Mar. 28, 1913	......	Sept. —, 1908	1905——	Flow affected by pondage.
Mohawk	W. Canada creek	Twin Rock Bridge	364.	....	....	......	....	....	Max. exceeds rating curve.
Mohawk	W. Canada creek	Wilmurt	198.	50.8	Mar. 28, 1913	.232	July 6, 1909	1909-1914	Max. exceeds rating curve.
Oswegatchie	Oswegatchie river	Newton Falls	166.	*13.2	Mar. 28, 1913	......	....	1912——	Flow affected by Cranberry L. storage.
Oswegatchie	Oswegatchie river	Heuvelton	961.	*12.2	Mar. 30, 1917	*.333	Oct. 16, 1916	1916——	Flow affected by Cranberry L. storage.
Oswegatchie	Oswegatchie river	Ogdensburg	1,580.	*11.4	Mar. 31, 1905	.187	June 10, 1915	1903-1916	Flow affected by Cranberry L. storage.
Oswegatchie	Oswegatchie river	Harrisville	245.	19.9	Mar. 28, 1917	.171	Aug. 17, 1918	1916——	

† De Ha reservoir (2.75 bil. cu. ft.) on Mohawk river and Hinckley reservoir (3.4 bil. cu. ft.) on West Canada creek put into operation about 1914.

Oswego	Butternut creek	Jamesville	53.	18.3	Sept. 14, 1915	.038	Sever	1907-1916	
Oswego	Canandaigua outlet	Alloway	440.	8.8	Mar. 29, 1916	.004	Dec. 24, 1916	1906-1917	
Oswego	Chittenango creek	Chittenango	77.	....	....	.260	Aug. 29, 1906	1901-1911	Flow affected by storage. Max. exceeds rating curve.
Oswego	Fish creek	Point Rock	104.3	80.5	Fall, 1897	......	....	....	
Oswego	Fish creek	McConnelsville	187.	32.7	1884	......	....	1898-1901	Flow affected by pondage.
Oswego	Limestone creek	Manlius	67.	14.9	Mar. —, 1914	.089	Aug. 23, 1913	1911-1916	Flow affected by pondage. Max. exceeds rating curve.
Oswego	Oneida creek	Kenwood	63.	27.2	Mar. 28, 1914	.048	Several	1907-1916	
Oswego	Oneida river	Caughdenoy	1,377.	8.1	Mar. 30, 1913	.000	Jan.&Mar.'14	1910-1917	Water below crest. No reported divers'n
Oswego	Oneida river	Euclid	1,400.	9.8	Mar. —, 1903	.187	Sept. 26, 1907	1902-1909	
Oswego	Onondaga creek	Syracuse	108.	16.1	Mar. 1, 1910	.240	July 25, 1910	1908-1911	
Oswego	Oswego river	Battle Island	5,069.	4.4	April 20, 1904	.130	Oct. —, 1913	1901-05, 07-14	
Oswego	Oswego river	Minetto	5,091.	5.2	April 5, 1915	1.450	Sept. 24, 1916	1900-1902	
Oswego	Owasco lake outlet	Auburn	206.	*13.3	Mar. 25-30, '13	.027	Oct. 15, 1915	1912——	Flow affected by pondage and storage.
Oswego	Seneca river	Baldwinsville	3,121.	3.30	Mar. 28, 1904	......	....	1898-1908	Flow affected by pondage
Oswego	Skaneateles lake	Jordan	93.	....	....	1.020	July 10, 1891	1890-1892	Low water flows only.
Oswego	Skaneateles lake	Willow Glen	74.25	2.74	Several	......	....	1895-1908	Flow affected by storage.
Raquette	Bog river	Near Tupper Lake	132.	12.8	April 16, 1910	.057	Oct. —, 1908	1908-1912	
Raquette	Raquette river	Raquette Falls	418.	12.0	May 3, 1911	.117	Sept. —, 1908	1908-1912	
Raquette	Raquette river	Massena Spr	1,205.	*13.7	Mar. 31, 1914	.042	Sept. 21, 1913	1908-1916	Flow affected by pondage and storage.
Raquette	Raquette river	Piercefield	723.	*9.8	April 1, 1913	.014	Sept. 2, 1913	1908——	Flow affected by pondage and storage.
Salmon	Orwell br	Altmar	22.1	27.6	April 7, 1912	.230	Several	1911-1915	
Salmon	Salmon river	Stillwater	191.	*52.4	Mar. 27, 1913	.260	1913	1911-1913	
Salmon	Salmon river	Pulaski	260.	*51.4	Mar. 27, 1913	.230	Sept. —, 1906	1900-07, 10-14	
W. St. Lawr'ce	St. Lawrence river	At Head	287,688.	1.22	May —, 1870	.463	Nov. —, 1895	1860——	Monthly values.
St. Regis	Deer river	Ironton	206.	*47.0	Jan. 17, 1913	*.083	Aug.-Sept. '13	1912-1916	
St. Regis	St. Regis river	Brasher Cen	621.	26.1	Mar. 27, 1914	*.055	Aug. 8, 1917	1910-17, 19——	
Susquehanna.	Chenango river	Binghamton	1,530.	22.5	Mar. 2, 1902	.007	Aug. 29, 1909	1901-1911	Flow affected by pondage.
Susquehanna.	Chenango river	Chenango Forks	1,380.	*20.2	April 2, 1916	......	....	1912——	Diversion from watershed.
Susquehanna.	Susquehanna river	Binghamton	2,400.	*26.0	Mar. 2, 1902	......	....	1901-1912	Flow affected by pondage.
Susquehanna.	Susquehanna river	Conklin	2,350.	....	....	.045	Sept. 16, 1913	1912——	

Note.— Table corrected for records to Sept. 30, 1919.

* Maximum and minimum flows are mean daily flows except as indicated by asterisk, where record of actual maximum and minimum flows were obtained.

Legislative Document **No. 84**

STATE OF NEW YORK
CONSERVATION COMMISSION

List of Lands in the Forest Preserve

March 20, 1920

Appendix to the 1919 Annual Report

ALBANY
J. B. LYON COMPANY, PRINTERS
1920

LIST OF LANDS IN THE FOREST PRESERVE

REPORT OF THE SUPERINTENDENT OF FORESTS

ALBANY, *March* 20, 1920.

Conservation Commission, Albany, N. Y.:

GENTLEMEN.— I would respectfully call attention to the administrative work in so far as it pertains to the many parcels of land constituting the forest preserve. This list of lands, although of little interest to the general public, is needed for handy reference by those that have to do with State owned lands in the Adirondack and Catskill regions. This data forms the basis for our land work both with reference to protection and also for the important work of extension and consolidation of the forest preserve.

In the preparation of this list, it is found that quite a number of parcels have been heretofore carried on our books with acreages that actual surveys indicate to be too large. The most of such lands came to the State by sales thereof by the Comptroller, for unpaid taxes and the areas formerly stated were those used by assessors in levying taxes. Some parcels have been carried on the books a long time, that were originally placed there in early land work, but which have been recently found to be errors in mapping. It has been our endeavor to eliminate so far as practicable all of these parcels that can not be found and to reduce and correct all known errors in acreages so that there may be no excuse for the taxation or protection of land that is non-existent.

As the work is made at a date that is intermediate between the dates of our annual reports, the areas stated will not be those that appear in the annual statements. The list includes all parcels acquired up to the date of going to press.

There are four general sources of title to these lands, viz.: purchases direct from owners; sales for unpaid taxes; appropriations (condemnations) and original ownership. Some lands have come to the State through the foreclosures of mortgages taken to secure loans made a long time ago and some have come by conveyances in making partitions or as the result of adjustments in contested cases.

In the column headed "Source of title and tax sale" it is the intention to show briefly so far as is practicable, the general manner by which the State acquired ownership, including the year of the tax sale which may be the source of the title. In many instances parcels appear to have been acquired both by purchase direct from owners and also by purchase at tax sales. This is accounted for in many instances by the fact that a specific part of a parcel was purchased from the owner and the balance of the parcel acquired at a sale for taxes. In other instances lands have been purchased from the owners and the vendors have turned over to the State certificates which entitled them to tax deeds from sales that antedated the sales to the State. In such cases tax deeds have been taken by the State as of the date of the tax sale and prior to the purchase deed. Such titles are cumulative. The records should always be consulted in case of contest over ownership. Lands designated as being of original ownership are those that have never been deeded or patented by the State.

A large area of appropriated land in Herkimer County is omitted for the reason that a late decision by the Supreme Court is to the effect that the land was not taken legally. There is included now as in the past, all State owned land in the 16 forest preserve counties which is not devoted by law to other specific uses, although 196,808.32 acres of the same is land under water. Although lands under water may not be thought by some to be such land as would ordinarily be classified as forest preserve land, we can not do otherwise than include them in the list, as the law prescribes that "The forest preserve shall include the lands owned or hereafter acquired by the State" in the 16 forest preserve counties.

The area of the forest preserve as shown by this list is as follows, viz:

Adirondack Preserve

County	Land	Water	Total
Clinton	12.923.55	38,094.42	51,017.97
Essex	293,437.47	53,853.00	347,290.47
Franklin	167,195,37	3,983.00	171,178.37
Fulton	32,446.12	....	32,446.12
Hamilton	621,940.63	11,397.00	633,337.63
Herkimer	189,476.87	3,354.90	192,831.77
Lewis	9,014.86	....	9,014.86
Oneida	4,676.71	23,332.00	28,008.71
St. Lawrence	68,506.73	34,000.00	102,506.73
Saratoga	10,019.29	....	10,019.29
Warren	127,008.26	26,618.00	153,626.26
Washington	2,161.00	2,176.00	4,337.00
Totals	1,538,806.86	196,808.32	1,735,615.18

Catskill Preserve

	Land only
Delaware County	11,513.63
Greene County	17,777.38
Sullivan County	1,157.18
Ulster County	90,848.69
Total	121,296.88

Summary

	Acres
Adirondack Preserve	1,735,615.18
Catskill Preserve	121,296.88
Total	1,856,912.06

Although great care has been exercised in the preparation of this list, the omission of any lands does not of necessity mean that the State does not claim ownership thereof. Original records should be consulted in case of contest over the title to any land in a forest preserve county.

Very truly yours,

C. R. PETTIS,

Superintendent State Forests.

LIST OF LANDS

BELONGING TO

THE FOREST PRESERVE

1920

CLINTON COUNTY

(*Total number of acres*, 51,017.97)

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		GORE (STATE) BETWEEN OLD MILITARY AND REFUGEE TRACTS,		
Mooers......	5	S. ½..........................	1859 & resale 1899.	86.20
do	6	S ½..........................	1859 & resale 1899.	88.
do	17	N. part and S. E. corner.......	1853 & resale 1899.	107.84
do	20	N. part......................	1859 & resale 1899.	70.56
		Total, State Gore, 352.60 acres.		
		LIVINGSTON PATENT, DIVISION 5, HART TRACT,		
Peru........	3	....	1881, '85.........	75.25
		MAUL'S PATENT,		
Ausable.....	196	B'd N. & E. by land formerly of Earl Pierce, S. by Ausable River & W. by school-house lot and lands sold in 1841 by Martin Pope to Hugh McClerkin......................	1881, '85.........	16.
		OLD MILITARY TRACT, TOWNSHIP 3,		
Black Brook..	1	N. part......................	1900, '05.........	326.
do ..	7	....	1877, '81, '90.....	853.33

CLINTON COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		OLD MILITARY TRACT, TOWNSHIP 3 — (*Continued*).		
Black Brook	8	Ex. 50a. N. E. cor. 12½c. wide, N. & S. & 40c. long E. & W., 250a. S. E. cor., 62½c. N. & S. & 40c. E. & W. and 16a. S. W. cor.	1890, '95	537.33
do	10	Ex. 189a. N. W. cor. sq	1877, '81, '85, '00	664.
do	10	N. W. cor. sq	1900	100.
do	11		1890, '95	853.
do	15		1871, '77, '81, '85	853.33
do	17	Sub. 3	1877, '81, '85	85
do	17	Sub. 4	1881, '90	85
do	17	Sub. 8	1871, '77, '81	85
do	17	Sub. 9	1871, '77, '81	85
do	18	Ex. 80a. S. E. cor	1877, '81, '85, '90	773
do	24	Ex. 90a. being all W. of river and S. of a line parallel to N. line of lot 53 ch. distant therefrom	1881, '85	763
do	26	N. E. cor. square	1881	113
do	27		1871, '77, '81, '85	853
do	33	All S. of Silver Lake not included in 50a. sq. S. E. corner of lot	1853	8.58
do	41	N. ½	1877, '81, '85, '95	426
do	72	S. E. cor. b'd W. by Musgrove	1877, '81, '85	161.05
do	73		1871, '77, '81, '85 '90	462.50
do	74	Ex. 100a. N. W. cor	1843 & resale 1859	753
		Total, T'wp. Three, 8,840.12 acres.		
		OLD MILITARY TRACT, TOWNSHIP 4,		
Saranac	67		1895, '00, '05	640
Black Brook	70	Sub. 5, N. p't across	1885	6
do	70	Sub. 7	1895, '00	77
Saranac	74	Pelkey, Gilbert; b'd N. by lot line E. by Lapan, S. by Burnah & W. by Rasco	1905	50
do	89	W. end of 140a. N. p't	1871	70

CLINTON COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		OLD MILITARY TRACT, TOWNSHIP 4 — (*Continued*).		
Black Brook..	90	Sub. 2........................	1877, '81, '85......	160
do ..	91	S. E. cor. square..............	1877, '81, '85, '90..	71
do ..	91	B'd on E. line 26c. 65l. N. of S. E. cor. 27c. 47l. on E., 27c. 77l. on E., 27c. 77l. on W. & 26c. 65l. on N. & S. lines.............	1871, '77, '81......	74
		Total, T'wp. Four, 1,148 acres.		
		OLD MILITARY TRACT, TOWNSHIP 5		
Ellenburgh...	43	S. W. cor.....................	1871.............	50
do ...	72	....	1858.............	213
do ...	105	S. E. cor.....................	1877.............	71.33
do ...	142	Ex. 62a. bd. beg. at a point on E. line of said lot 30r. N. of S. E. cor. th. W. par'l with S. line 100r. th. N. par'l with E. line 100r. th. E. par'l with S. line 100r. to E. line of lot and th. S. on E. line 100r. to beg.......	1895, '00.........	151.53
do ...	143	....	1895, '00.........	213.33
do ...	144	....	1895, '00.........	213.33
do ...	160	....	1877, '81, '85, '95..	213.33
do ...	161	....	1877, '81, '85, '95..	213.33
		Total T'wp. Five, 1,338.98 acres.		
		OLD MILITARY TRACT, TOWNSHIP 6		
do ...	15	N. E. cor.....................	1871.............	26
Clinton......	24	N. E. cor. 50r. wide N. & S. & 160r. long E. & W...........	1900, '05.........	50
do	35	E. p't 178r. wide, 356a. ex. 106a. being Sub. 1, S. E. cor. of lot b'd N. by 25a. N. p't of lot...	1885.............	250
do	37	Sub. 4........................	1900, '05. '10......	52.81
do	48	On N. line 118r. W. from N. E. cor., 120r. N. & S. & 9½r. E. & W......................	1881, '85.........	7
		Total, T'wp. Six, 385.81 acres.		

CLINTON COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		PLATT'S GREAT LOCATION,		
Peru	31	B'd N. by land formerly of Benj. Bragg, E. by Prentiss Hewitt, S. by A. H. Merritt and W. by J. B. Spalding		5
		REFUGE TRACT, 420 ACRE LOTS,		
Chazy	7	S. E. cor	1853	45
Mooers	20	S. p't. N. ½, Sam'l St. John, b'd N. by a line par'l with N. line of lot	1900	32.50
do	102	B'd beg. in cent. of highway opposite Wood's dwelling in line with W. side of road leading N. to Wood & Co.'s starch factory, th. N'ly 10r. to a stake on W. line of said Road, th. W'ly par'l with the road running E'ly from Wood's Falls, 75ft., th. S'ly par'l with E. line of this land 10r., and th. E'ly along cen. of highway 75 ft. to beg	1895	.29
do	103	George White; bd. begins at N. E. cor. of land of Wm. Wilson in W. line of highway from Wood Co.'s store to Altona	1895	1
do	149	S. pt	1853	156
do	176	S. E. cor	1853	48
do	195	W. ½	1853	210
do	197	W. ½ of S. W. ¼	1877, '81	52.50
do	203	E. pt. b'd W. by Killis	1877	100
do	204	S. E. cor	1853	12
do	210	N. W. ¼	1871, '81, '85	104.50
		Total, Refugee Tract, 761.79 acres.		
		Waters.		
		Lake Champlain, all in Clinton Co	Original	37,760
Black Brook	33	Silver Lake	1885	334.42
		Total, Waters 38,094.42a.		

ESSEX COUNTY

(*Total number of acres*, 347,290.47.)

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		BRANT LAKE TRACT		
Schroon	1		Pur. 1908, & 1910.	120
do	2	All in Essex Co.	Pur. 1908, & 1910.	53
do	34	All in Essex Co.	Pur. 1908, & 1910.	48
do	35		Pur. 1908, & 1910.	96
do	36		Pur. 1908, & 1910.	96
do	37	All in Essex Co.	Pur. 1908, & 1910.	56
do	66	All in Essex Co.	Pur. 1908, & 1910.	63
do	67		Pur. 1908, & 1910.	96
do	68		Pur. 1908, & 1910.	96
do	69	All in Essex Co.	Pur. 1908, & 1910.	65
do	98	All in Essex Co.	Pur. 1908, & 1910.	65
do	99		Pur. 1908, & 1910.	96
do	100		Pur. 1908, & 1910.	96
do	101	All in Essex Co.	Pur. 1908, & 1910.	69
do	130	All in Essex Co.	Pur. 1908, & 1910.	72
do	131		Pur. 1908, & 1910.	96
do	132		Pur. 1908, & 1910.	96
do	133	All in Essex Co.	Pur. 1908, & 1910.	75
do	162	All in Essex Co.	Pur. 1908, & 1910.	79
do	163		Pur. 1908, & 1910.	96
do	164		Pur. 1908, & 1910.	96
do	165	All in Essex Co.	Pur. 1908, & 1910.	83
do	194	All in Essex Co.	Pur. 1908, & 1910.	85
do	195		Pur. 1908, & 1910.	96
do	196		Pur. 1908, & 1910.	96
do	226	All in Essex Co., 31a. ex. $17\frac{6}{10}$a. W. part thereof, a strip of an average width of 15c 16l. E. & W., bd. by the Lake Shore	Pur. 1908, & 1910.	13.40
do	227	Ex. $43\frac{88}{100}$a. W. pt. thereof, being a strip, &c	Pur. 1908, & 1910.	31.62
		Total, Brant Lake Tract, 2,130.02 acres.		
		ELLIS TRACT OR PATENT		
Ticonderoga	...	Gore, bd. N. by lots 262, 263 and 264 Ellis Tract, E. by lot 94 Ellis Tract, S. by the Town of Hague & W. by lot 29 Hague Tract	Pur. 1908	218
do	94	All in Essex Co. 44a. ex. 15a E'ly part	Pur. 1908, & 1910.	29

ESSEX COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		ELLIS TRACT OR PATENT — (*Continued*).		
Ticonderoga..	262	....	Purchase 1908....	254
do ..	263	....	Purchase 1908....	194
		Total Ellis Tract, 695 acres.		
		ESSEX TRACT, HENRY'S SURVEY,		
Lewis.......	16	Parcel 32 rods N. & S. and 20 rods E. & W., East of W. H. Stover coal kiln in 1867......	1885............	4
do	47	E'ly part....................	1895............	51
do	58	....	1900, '05.........	160
do	83	W. side across 75 rds. wide.....	1885, '90.........	75
Keene.......	128	N. pt. Taylor Mill Lot.........	1877, '81.........	1
Elizabetht'wn	158	....	1885, '90.........	80
Keene.......	179	....	Pur. 1905, '05, '10.	160
do	180	....	Pur. 1905, '05, '10.	160
do	181	....	Pur. 1905, '05, '10.	160
do	182	....	Pur. 1905, '05, '10.	160
do	185	....	1881, '85.........	172
do	214	....	Original & resale 1899...........	176
do	215	....	Original & resale 1899...........	160
do	222	....	1881, '85.........	160
do	231	....	1877, '81, '85, '95..	201.40
		Total, Essex Tract, 1,880.40 acres.		
		GORE BETWEEN TOWNSHIP 1, O. M. T., AND ROARING BROOK TRACT,		
Elizabeth'twn	...	W. end across 18 ch. wide......	Original & resale 1899...........	36
Newcomb....	...	Gore Between Twp. 47, T. & C. P. and O. M. T. B'd N. by Macomb's Purchase and S. by Gore E. of Twp. 47..........	Original..........	187.50
		GUISE'S PATENT,		
Schroon.....	...	All Ex. strip on shore of Lake, 15 ch. 16 lks. wide............	Pur. 1908 & 1910..	718.71

ESSEX COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		HAGUE TRACT,		
Ticonderoga	20		Purchase, 1908	165
do	21		Purchase, 1908	222.30
do	26		Purchase, 1908	146.20
do	27		Purchase, 1908	146.20
do	28	All in Essex Co	Purchase, 1908	161
do	29	All in Essex Co	Purchase, 1908	100
		Total, Hague Tract, 940.70 acres.		
		HOFFMAN TOWNSHIP,		
Schroon	A		1877, '81, '85, '90	200
do	B		1877, '81, '85	200
do	C		1895, '00	200
do	D	All in Schroon	1877, '81, '90 and Purchase 1898	100
Minerva	D	All in Minerva of 145a S. part of lot	Purchase 1898	95
Schroon	E	All in Schroon	1877, '81, '85	50
Minerva	E	All in Minerva	1877, '81	150
do	F	S. part	1877, '81, '85	125
do	F	N. part	1877	125
Schroon	1		1877,'81,'85,'90,'95	250
do	2		1885, '90, '95	250
do	3		1881, '85 & Purchase 1898	250
do	4		1885, '90, '95	250
do	5		1877,'81,'85,'90,'95	250
do	6		1877,'81,'85,'90,'95.	250
do	7		1877,'81,'85,'90,'95.	250
do	8		1877, '81, '85, '95	250
do	9		1877, '81, '85, '95	250
do	10		1881, '85, '95	250
do	11		1885, '90, '95, '05 & Pur. 1897	250
do	12		Pur. 1898 & '00	250
do	13	W. ½	Purchase 1910	125
do	14		1877, '81, '85	250
do	15	Ex. 10 acres sq. N. W. cor. of N. E. ¼ and 30a. sq. N. W. cor. of S. W. ¼	1877, '81, '85 & Purchase 1899	210
do	16	N. ½ & S. W. ¼	1877, '81, '85, '90	187.50
do	18		1877, '85, '90, '95	250

ESSEX COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		HOFFMAN TOWNSHIP — (*Cont'd*).		
Schroon......	19	S. ½...........................	Pur. 1898 & 1900..	125
do	20	....	1877,'81'85,'90,'95.	250
do	21	....	Purchase 1905....	250
do	22	....	Purchase 1905....	250
do	23	....	1885, '90..........	250
do	28	S. ½...........................	1877, '81, '85......	125
do	29	....	1877, '81, '85......	250
do	30	N. ½...........................	Purchase 1907....	125
do	38	S. E. ¼ ex. 2½a. N. W. cor......	Purchase 1909....	60
do	42	....	Purchase 1897....	250
do	43	....	1877, '81, '85......	250
do	53	N. W. ¼........................	Purchase 1919....	62.50
do	54	....	Purchase 1919....	250
do	55	Ex. N. W. ¼....................	Pur. 1897 & 1919..	187
do	56	Ex. 37½a. N. W. cor...........	Purchase 1897....	212.50
do	57	....	1885, '90..........	250
do	58	....	1881, '85, '90.....	250
do	60	S. E. ¼........................	Purchase 1905.....	62.50
Minerva.....	65	N. W. Cor. Sq.................	Pur. 1907 & 1910..	100
do	66	W. Pt..........................	1877, '90..........	90
do	67	....	1885, '90, '95.....	250
Schroon.....	72	....	Pur. 1908 & 1910..	250
do	74	....	1877, '81, '85, '90..	250
do	75	....	1877, '81, '85.....	250
do	76	....	1890, '00 & conveyed in partition..........	250
do	77	....	Pur. 1908, partition 1904 & T. S. 1910	250
do	78	S. E. corner...................	Pur. 1908 & 1910..	42
do	80	N. ½...........................	Purchase 1908.....	125
do	81	All in Schroon.................	1881, '85.........	125
Minerva.....	93	S. W. part.....................	1881..............	120
do	94	N. ½ ex. 45a. W. part..........	1871, '77, '81.....	80
do	95	N. part bd. S. by Kennison.....	1895, '00.........	100
do	96	....	1895, '00.........	250
		Total, Hoffman Twp., 11,259 acres.		
		IRON ORE TRACT,		
Moriah......	19	N. E. part.....................	1895..............	33
Elizabeth'twn	78	S. ½...........................	1881..............	72
Westport....	92	N. W. cor......................	1890..............	45

ESSEX COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		IRON ORE TRACT—(*Continued*).		
Elizabeth'twn	142		1871, '77, '81	63
do	197		1895	160
do	205	S. E. ¼, Ex. und. ½	1881	30.75
do	217	Bd. beg. at S. W. cor. of lot 221, th. S. 40r., th. E. to E. line of lot, th. N. on E. line to E'ly cor. lot to beg	Mortgage	68
do	218	Triangle in W'ly end	1881	9.70
		Total Iron Ore Tract, 481.45 acres.		
		JAY TRACT		
Wilmington	6	Ex. 50a. N. E. cor. square	Pur. 1907 & 1910	280
do	11	Ex. 160a. W. part	Purchase 1907	40
do	12	W. part	1915	100
do	20	Ex. 40a. E. end 16 ch. wide; 30a. W. end of lot and 3½a. W. side of highway	Purchase 1908	131.25
do	21	N. end across	Purchase 1908	111
do	22		Purchase 1908	227
do	25		1871, '77, '81	278.80
do	29		1881, '85	429
do	32	Ex 200a. N. pt	1853	150
do	40		1915	365
do	52	S. ½	Purchase 1907	248.50
do	71	N. E. part	Original. Resale '99	40 00
do	125	Ex. 20a. S. end	Purchase 1919	306.00
		Total, Jay Tract, 2,706.55 acres.		
		LAKE GEORGE ISLANDS,		
Ticonderoga		Prisoner's	Original	⅛
do		Willow	Original	
		LAKE CHAMPLAIN ISLAND,		
Westport		Cole or No Man's Island	Original	
		LEWIS (STEWART) TRACT,		
do		All	1895, 1900	200
		MAUL'S PATENT,		
Lewis	9	N. ½ of S. ½	1890	50
Chesterfield	30	All in Chesterfield	1877, '81	75

ESSEX COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		MAUL'S PATENT — (*Continued*).		
Chesterfield	56		1877, '81, '85	200
do	106	N. ½	1881, '85	100
		Total, Maul's Patent, 425 acres.		
		NORTH RIVER HEAD TRACT		
N. Hudson	9		Purchase 1905 & 1905, '10	160
do	10		Purchase 1905	160
do	11		Purchase 1905	160
do	12		1885, '90	160
do	16		1890, '95	160
do	19		1885, '90	160
do	25		1885	160
do	26		1905, '10	160
do	43		1900, '05	160
do	44		1881, '85	160
do	45		1905, '10	160
do	46		1877, '81, '85	160
do	50		1885, '90	160
do	85	All in North Hudson	1885, '90	54
Keene	85	All in Keene	1885, '90	15.20
do	96		1885, '90	160
Elizabetht'wn	98	S. ½ and N. E. ¼	1877	120
do	103		1871, '77, '81, '90, '95	160
do	110		1871, '77, '81, '90, '95	160
do	126		1871, '90	160
do	128 & 129	Split Rock Falls Lot	1877, '81, '85	6
		Total N. R. H. Tract, 2,915.20 acres.		
		OLD MILITARY TRACT, TOWNSHIP 1, THORN'S SURVEY,		
do	16	S. W. ¼	1877, '81	30
Lewis	44		Original & 1853 & resale 1899	160
do	50	S. W. ¼	1877, '81, '85 and conveyed in partition	36

ESSEX COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		OLD MILITARY TRACT, TOWNSHIP 1, THORN'S SURVEY — (*Continued*).		
Elizabetht'wn	55	W. ⅔	1877, '81, '85	106.66
do	79		Original	138
do	81		Original	160
Keene	84	W'ly part	Pur. 1909	30
do	85		1885, '05	160
do	86		Pur. 1908 & 1910	120
do	87		Purchase 1908	160
do	88		Original	160
do	89		Pur. 1908 & 1910	160
do	90		Pur. 1908 & 1910	160
do	91		Purchase 1919	160
do	101		Purchase 1919	160
		Total, Twp. One, 1,900.66 acres.		
		OLD MILITARY TRACT, TOWNSHIPS 1 AND 2, RICHARDS' SURVEY,		
do	14	W. end N. of Walton Brook	1877, '81	57
do	15	Ex. 20a. S. side	1877, '81	330
do	23		Purchase 1920	228
do	38	N. W'ly part	Purchase 1919	545.77
do	42		Purchase 1908	299.25
do	45		Pur. 1905 & 1905	256.75
do	46		Pur. 1905 & 1905	328
do	47		Pur. 1905 & 1905	568
do	48		Pur. 1905 & 1905	518.30
do	49		Purchase 1908	299.30
do	50	All in Keene	1885, '90, '95	375
Wilmington	50	All in Washington	1871, '77, '81, '85	187
do	51	N. pt. in Wilmington	1871, '77, '81	205
do	52	All in Wilmington	1877, '81, '85	247.50
Keene	52	All in Keene	1881, '85	514.75
Wilmington	54		1877, '81, '85, '95	1,002
do	56		1877, '81, '85, '90	382
Keene	57		Pur. 1905 & 1905	436.18
do	58		Pur. 1905 & 1905	487.28
do	60	Ex. 100 acres S. W. part and ex. 27.77a. N. E. cor. N. of highway	Pur. 1905 & 1910	935.53

ESSEX COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		OLD MILITARY TRACT, TOWNSHIPS 1 AND 2, RICHARDS' SURVEY — (*Continued*).		
Keene	61	S. ½	Pur. 1905 & 1905	211
do	62		Conveyed & 1910	1,000
do	63		Pur. 1905 & 1905	704
do	64	All S. of and out of view from the Cascade Lake House	Pur. 1905 & 1905	443
do	65		1877, '81, '85	914.50
do	69		1877, '81, '85	911
do	70		Pur. 1905 & 1905	1,091.20
do	86		Purchase 1908	578
do	89	W. part	1895, '00	26
do	90	W. end 42 ch. E. & W. & 115.50 ch. N. & S. and sub. 14	Purchase 1918	518.80
do	93		1877, '81, '85	592
		Total, Twp. 1 & 2, Richards' Survey, 15,191.81 acres.		
		OLD MILITARY TRACT, TOWNSHIP 11, RICHARDS' SURVEY,		
St. Armand	1		1877, '85	120
do	2		1910, 1915	160
do	3		Original & resale '99	160
do	4		1885, '90, '95	160
do	5		1885, '90, '95	160
do	6		1877, '81, '85, '95	160
North Elba	15	Ex. Railway	1877, '81, '85, '90	156
do	16	Ex. Railway	1885, 1895	115.40
do	20		1877, '81, '85, '90	160
Ft. Armand	21		1885	120
do	22		1871, '77	160
do	26		1877, '81, '85, '95	160
do	28	Ex. 110a. N. W. cor	1871, '77	50
do	30	Ex. 3a. W. of highway	Appropriated 1905	157
North Elba	34	Ex. Railway	1877, '81, '85, '90	155.40
do	35	Ex. Railway	1877, '81, '85, '90	157.90
do	38		1877,'81,'85,'90,'95	160
do	39		1877,'81,'85,'90,'95	160
do	40		1877, '81, '85, '90	160

ESSEX COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		OLD MILITARY TRACT, TOWNSHIP 11, RICHARDS' SURVEY —(*Continued*).		
St. Armand	41	W. Pt.	1871	103
do	42		1877, '85	160
do	43		1877, '81	160
do	44		1890, '95	160
do	45		1877,'81,'85,'90,'95.	160
do	46	N. E. ¼	1885, '90	40
do	50		1877, '81, '85, '95	100
North Elba	55	N. ½	1877, '81, '85, '90	80
do	58		1843 & appropriated 1918	160
do	59		1877, '81, '85, '95	160
do	60		1877,'81,'85,'90,'95.	160
do	64		1885, '90, '95	160
St. Armand	69		Appropriated, 1905	160
do	70	N. ½ & S. E. ¼	1877, '81, '85, '90	120
do	71		1877, '81, '85, '95	160
North Elba	72		1877, '81, '85, '95	160
do	73		1877, '81	160
do	74		1877, '81, '85, '90	160
do	77	Ex. Railway	1877, '81, '90, '95	158.60
do	78	Ex. Railway	1877, '81, '85, '95	158.60
North Elba	79		1877, '81, '85, '95	160
do	80		1871, '77, '81, '85, '90	160
do	81		1877, '81, '85, '90, '95	160
St. Armand	86	S. pt	1871, '77	120
do	88		1871, '77, '81, '85	160
do	89		1895, '00	160
do	90		1871, '77, '81	160
do	91		1877, '81, '85, '95	160
do	92		Pur. 1906 & 1900	160
North Elba	93		1877, '81, '85	160
do	94	Ex. 4.02a. Water Works	Purchase 1906	155.98
do	98	S. ½ & N. E. ¼	1877, '81, '85, '90 '95	120
do	99		1877, '81, '85, '95	160
do	100		1877, '81, '85, '95	160
St. Armand	106		1885, '90, '95	160
do	107		1877, '81, '85, '90, '95	160

ESSEX COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		OLD MILITARY TRACT, TOWNSHIP 11, RICHARDS' SURVEY —(*Continued*).		
St. Armand	108		1871, '77, '81, '85	160
do	109		1877, '81, '85, '95	160
do	110		1877, '81, '85, '95	160
do	111		Pur. 1900 & 1905	160
do	112		Purchase 1919	160
do	114	N.W. ¼ and S.W. ¼ ex. 15a. N. end	Pur. 1917 & 1881, '85	65
do	114	S. E. ¼ ex. 15a. N. end	Purchase 1920	25
do	115		Pur. 1917 & 1877, '81, '85, '95	160
do	118	Ex. Railway	1877, '81, '85, '95	157.50
do	120		1877, '81, '85, '90, '95	160
St. Armand	124		1877, '81, '85	160
do	125		1871, '77, '81	160
do	127		1877, '81, '85, '90, '95	160
do	128		1871, '77, '81	160
do	129		1871, '77, '81	160
do	130		1877, '81, '85, '95	160
North Elba	133		1871, '77, '81, '85, '95	160
do	134		1877, '81, '85, '95	160
do	135		1877, '81, '85, '95	160
do	136		1871, '77, '81, '85, '90	120
do	137		1871, '77, '81, '85,	200
do	138	N. ½ 80a. ex. Railway	1881, '85, '90	77.30
do	139	Ex. Railway	1877, '81, '85, '95	157.30
do	140		1877, '81, '85, '95	160
St. Armand	144		1877, '81, '85, '90	160
do	145		1877, '81, '85, '95	160
do	146		1877, '81, '85, '95	160
do	147		1877, '81, '85, '90, '95	160
do	148		1871, '77, '81, '90	160
do	149		1877, '81, '85, '95	160
do	150		1877, '81, '85, '90, '95	160

ESSEX COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		OLD MILITARY TRACT, TOWNSHIP 11, RICHARDS' SURVEY —(*Continued*).		
North Elba..	153		Appropriated 1919.	160
do ..	154		1877, '81, '85, '95..	160
do ..	155		1877, '81, '85, '95..	160
do ..	156	N. W. cor.	1877, '81, '85, '95..	70
do ..	157		1877, '81, '85, '90, '95	200
do ..	159	N. ½ & S. W. ¼, 120a. ex. Railway	1877, '85, '90, '95..	114.40
do ..	160		1877, '81, '85, '90, '95	160
St. Armand..	163		1885, '90, '95	200
do ..	165		1877, '81, '85, '95..	200
do ..	166		1877, '81, '85, '95..	200
do ..	167		1877, '81, '85, '95..	200
do ..	168		1877, '81, '85	200
do ..	169		1877, '81, '85, '90, '95	200
do ..	170		1885, '90, '95	200
North Elba..	172		Appropriated 1919.	160
do ..	173		Appropriated 1919.	160
do ..	174		Appropriated 1919 & 1877, '81, '85, '90	70
do ..	175		1877, '81, '85, '90, '95	160
do ..	176		1877, '81, '85, '95..	120
do ..	177	W. ½	1881, '85	50
do ..	178		1877, '81, '85	200
do ..	179	Ex. Railway	1871, '77, '85	126.50
do ..	180		1877, '81, '85, '90, 95	160
St. Armand..	181	W. side, 35c. wide	1877, '81, '85	105
do ..	182		1877, '81, '90	300
do ..	183		1885, '90, '95	300
do ..	184		1877, '81, '85, '95..	300
do ..	185		1877, '81, '85, '95..	300
do ..	186		1877, '81, '85	300
do ..	187		1877, '81, '85, '90, '95	160
do ..	188		1877, '81, '85, '95..	160
do ..	191		Appropriated 1919.	160

ESSEX COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		OLD MILITARY TRACT, TOWNSHIP, 11, RICHARDS' SURVEY — (*Continued*).		
North Elba	192		Appropriated 1919.	160
do	193		1877, '81, '85, '90	160
do	194		Appropriated 1919.	160
do	195		1877, '81, '85, '95	160
do	196	N. ½ and S. E. ¼	1877, '81, '85, '95	90
do	197		1877, '81, '95	175
do	198		Pur. 1898 & 1877, '81, '85	195
do	199	Ex. Railway	Pur. 1897 & 1877, '81, '85	196.60
do	200	Ex. Railway	1877, '81, '85, '95	154.60
St. Armand	201		1885, '90, '95	120
do	202		Pur. 1897 & 1885, '90	160
do	203		1877, '81, '85, '95	160
do	204		1877, '81, '85, '95	160
do	205		1877, '81, '85, '95	160
do	206		1877, '81, '85, '95	160
do	207		1877, '81, '85, '95	160
do	208		1877, '81, '85, '95	160
do	209		1877, '81, '85	160
do	211		1877, '81, '85, '90, '95	160
North Elba	212		Appropriated 1919.	160
do	213		1877, '81, '85	160
do	215		1877, '81, '85, '95	160
do	218	Ex. N. ½ of N. E. ¼ and und. ⅓ of S. W. ¼	Conveyed in partition 1904 & 1877, '81, '85	106.66
St. Armand	221		1885, '90, '95	120
do	222		1885, '90	160
do	223		1877, '81, '85, '95	160
do	224		Pur. 1905 & 1877, '81, '85, '95, '10.	160
do	225		1877, '81, '85	160
do	226		1877, '81, '85, '95	160
do	227		1877, '81, '85, '90	160
do	228		1877, '81, '85	160
do	230		1877, '81, '85	160
do	231		1877, '81, '85	160

ESSEX COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		OLD MILITARY TRACT, TOWNSHIP 11, RICHARDS' SURVEY — (*Continued*).		
North Elba	232		1877, '81, '85, '95	160
do	233		1877, '81, '85, '95	160
do	234	N. ½ and S. W. ¼	1877, '81, '85	120
St. Armand	241		1877, '81, '85	120
do	242		1877, '81, '85, '90, '95	160
do	243		1877, '81, '85	160
do	244		1877, '81, '85	160
do	245		1877, '81, '85, '90	160
do	246		1877, '81, '85	160
do	247		1877, '81, '85	160
do	248		1877, '81, '85, '95	160
do	249		1877, '81, '85, '95	160
do	250		1877, '81, '85, '90, '95	160
do	251		1871, '77, '81, '95	160
North Elba	252		1877, '81, '85, '95	160
do	253	N. E. ¼	1871, '77, '81, '85	40
St. Armand	262		1877, '81, '85, '95	160
do	263		1877, '81, '85	160
do	264		1877, '81, '85, '90	160
do	265		1877, '81, '85, '95	160
do	266		1877, '81, '85, '95	160
do	267		1877, '81, '85, '90	160
do	269	Ex. 100a. N. W. cor. square	1877, '81, '85, '95	160
do	270		1885, '90, '95	160
do	271		1877, '81, '85, '95	160
North Elba	275		1877, '81	160
St. Armand	282		1877, '81, '85	160
do	283		1877, '81, '85, '95	160
do	284		1877, '81, '85, '95	160
do	285		1877, '81, '85, '90, '95	160
do	286		1877, '81, '85, '95	160
do	287		1877, '81, '85, '95	160
do	288		1877, '81, '85, '95	160
do	289		1877, '81, '85, '95	160
do	290		1877, '81, '85, '95	160
do	302		Pur. 1907 & 1910	120
do	303		1877, '81, '85, '95	120

ESSEX COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		OLD MILITARY TRACT, TOWNSHIP 11, RICHARD'S SURVEY — (*Continued*).		
St. Armand..	304		1877, '81, '85, '95..	120
do ..	305		1877, '81, '85, '90, '95	120
do ..	306		1877, '81, '85, '90, '95	120
do ..	307		1877, '81, '85, '95..	120
do ..	308		1877, '81, '85, '90, '95	120
do ..	309		1877, '81, '85, '95..	120
do ..	310		1877, '81, '85	120
North Elba..	318		1877, '81, '85, '95..	160
St. Armand..	321		1877, '81, '85	120
do ..	322		1877, '81, '85, '90..	160
do ..	323		1877, '81, '85, '95..	160
do ..	324		1881, '85, '95	160
do ..	325		Pur. 1918 & 1877, '81, '85, '95	160
do ..	326		1877, '81, '85, '95..	160
do ..	327		1877, '81, '85, '95..	160
do ..	328		1877, '81, '85, '95..	160
do ..	329		1877, '81, '85, '95..	160
do ..	330		1877, '81, '85, '95..	160
North Elba..	337	S. ½ and N. W. ¼	1877, '81, '85, '90, '95	150
do ..	338		1877, '81, '85	160
St. Armand..	341	S. part 17c. N. & S	Purchase 1906	68
do ..	347		1877, '81, '85, '95..	160
do ..	350		1877, '81, '85	160
North Elba..	354		1877, '81, '85, '95..	160
do ..	355		1877, '81, '85, '95..	160
do ..	357		1877, '81, '85	200
do ..	358		1877, '81, '85, '95..	160
do ..	359	S. E. ¼	1877, '81	40
do ..	360	N. ½	1877, '81, '95	80
do ..	361	S. W. cor. W. of Mill Brook 17 ch. N. & S	Purchase 1906	37
do ..	369		Pur. 1905 & 1905..	160
St. Armand..	375		Mortgage & 1900..	160
		Total, Township 11, 33,613.74 acres.		

ESSEX COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		OLD MILITARY TRACT—(*Cont'd*) TOWNSHIP 12, RICHARDS' SURVEY,		
North Elba..	1	Sub. 3......................	Original..........	155.80
do ..	2	Sub. 1, ex. N. W. ¼............	1881, 85, '90......	123
do ..	2	Sub. 3......................	1871, '77, '81, '85..	192.70
do ..	2	Sub. 4, ex. N. W. ¼............	1885, '90..........	138
do ..	3	....	Original. Resale '59	1,440
do ..	4	....	Original. Resale '59	835
do ..	5	....	1877, '81, '85, '95..	839
do ..	6	N. ½........................	1877, '81, '85......	720
do ..	7	Sub. 1......................	Original..........	160
do ..	7	Sub. 2......................	Original..........	160
do ..	7	Sub. 3, und. $\frac{4}{5}$................	1885, '90..........	83.66
do ..	10	Sub. 1......................	1871, '77, '81, '85..	168
do ..	10	Sub. 2......................	Original..........	152
do ..	10	Sub. 3, und. $\frac{5}{12}$..............	1881, '85, '90.....	82.25
do ..	10	Sub. 4, und. $\frac{3}{12}$..............	1881, '85, '90.....	44.65
do ..	13	....	1877, '81, '85.....	847.60
do ..	14	....	Purchase 1899....	1,440
do ..	17	Sub. 2......................	1871, '77, '81, '85, '90............	151.70
do ..	17	Sub. 3, N. E. ¼................	1871, '77, '81, '85..	34.25
do ..	22–27	Sub. 15......................	1877, '81, '85.....	140
do ..	22–27	Sub. 16......................	1877, '81, '85.....	100
do ..	22–27	Sub. 17......................	1877, '81, '85, '95..	100
do ..	22–27	Sub. 18......................	1877, '81, '85, '95..	100
do ..	22–27	Sub. 19......................	1877, '81, '85, '95..	100
do ..	22–27	Sub. 20......................	1877, '81, '85, '95..	100
do ..	22–27	Sub. 21......................	1877, '81, '85, '95..	100
do ..	23	Sub. 1......................	1877, '81, '85, '90..	160
do ..	23	Sub. 2, ex. S. E. ¼............	1871, '77, '81, '85..	111
do ..	23	Sub. 3......................	1877, '81, '85, '90, '95............	188
do ..	23	Sub. 4......................	1871, '77, '81, '85, '90, '95........	174
do ..	24	Sub. 1, N. E. ¼ & S. W. ¼.......	1877, '81, '85, '90, '95............	82
do ..	24	Sub. 2......................	1871, '77, '81, '95..	152
do ..	24	Sub. 3......................	1877, '81, '85, '90, '95............	148
do ..	24	Sub. 4, N. W. ¼................	1871, '77, '81......	34.25
do ..	30	....	1877, '81, '85, '90..	1,458
do ..	31	....	1877, '81, '85, '90..	709.75

ESSEX COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		OLD MILITARY TRACT, TOWNSHIP 12, RICHARDS' SURVEY — (*Con.*)		
North Elba	32	S. ½	1877, '81, '85, '95	314.50
do	33	Ex. N. E. ¼ of S. E. ¼	1877, '81, '85, '95	583
do	34		1877, '81, '85	711.75
do	36	N. W. cor. of S. E. ¼	1885, '90, '95	40
do	37		Original and conveyed 1917	1,121
do	38		Original & resale '59	1,449
do	39		1877, '81, '85, '95	708.40
do	40		Original & resale '59	614.75
do	41		Pur. 1900 & 1905	540
do	42		Pur. 1900 & 1905	624.80
do	43		Original & resale '59	1,278
		Town, Township 12, Richards. survey, 19,709.81 acres.		
		OLD MILITARY TRACT, TOWNSHIP 12, THORN'S SURVEY,		
do	1	N. ½ and S. W. ¼	1877, '81, '85, '90, '95	120
do	2		1877, '81, '85, '90, '95	160
do	3		1877, '81, '85, '90, '95	160
do	4		Pur. 1900 & 1877, '81, '85, '90, '95.	160
do	5	N. ½ & S. W. ¼	1877, '81, '85, '95	120
do	6		1877, '81, '85, '95	160
do	7		1877, '81, '85, '90, '95	160
do	8		1877, '81, '85, '95	160
do	9		1877, '81, '85, '90, '95	160
do	10		1877, '81, '85, '90, '95	160
do	11		1877, '81, '85, '90, '95	160
do	12		1877, '81, '85, '90, '95	160

ESSEX COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		OLD MILITARY TRACT, TOWNSHIP 12, THORN'S SURVEY — (*Continued*).		
North Elba	13		Pur. 1900 & 1905	160
do	14		1877, '81, '85, '95	160
do	15	S. ½ and N. E. ¼	1877, '81, '85, '95	120
do	16		1877, '81, '85, '95	160
do	17		1877, '81, '85, '90, '95	160
do	18		1877, '81, '85, '90, '95	160
do	19		1877, '81, '85, '90, '95	160
do	20		1877, '81, '85, '95	160
do	21		Pur. 1900 & 1877, '81, '85, '95, '15	160
do	22		1877, '81, '85, '95, '05	160
do	23	N. W. ¼, S. ½ and N. E. ¼, S. E. cor. square 15a	Pur. 1900, '06, & 1877, '81, '85, '90, '95, '05	135
do	24		1877, '81, '85, '90, '95, & Pur. 1900	160
do	25		1877, '81, '85, '90, '95	160 160
do	26		1877, '81, '85, '90, '95	160
do	27		1877, '81, '85, '90, '95	160
do	28		1877, '81, '85, '95	160
do	29		1877, '81, '85, '90	160
do	30		1877, '81, '85, '95	160
do	31	S. ½	1877, '81, '85, '90, '95	80
do	32		1877, '81, '85	160
do	33		1877, '81, '85	160
do	34		1877, '81, '85, '90, '95	160
do	35	S. ½ and N. E. ¼	1877, '81, '85, '95	120
do	36		1877, '81, '85, '95	160
do	37		1877, '81, '85	160
do	40		1877, '81, '85	160

ESSEX COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		OLD MILITARY TRACT, TOWNSHIP 12, THORN'S SURVEY — (*Continued*).		
North Elba	41		1877, '81, '85, '90, '95	160
do	42		1877, '81, '85, '90, '95, 1900	160
do	43		1877, '81, '95	160
do	47		1877, '81, '85, '95	160
do	48		1877, '81, '85, '95	160
do	49	N. ½ and S. E. ¼	1877, '81, '85, '90	120
do	50		1871, '77, '81, '95	160
do	53		1877, '81, '85, '95	160
do	54	N. ½ and S. W. ¼	1877, '81, '85, '95	120
do	55	S. W. ¼	1881, '85, '95	40
do	56	S. W. ¼	1871, '77, '81, '85, '95	40
do	59		Pur. 1897 & 1871; '77, '81, '85, '90	160
do	60	N. W. ¼	1877, '81, '85, '95	40
do	61		1877, '81, '85	160
do	62		1877, '81, '85, '90, '95	160
do	63		1877, '81, '85, '90, '95	160
do	64		1877, '81, '85	160
do	65		1877, '81, '85	160
do	66	N. W. ¼	1881, '85	40
do	67	S. ½ and N. E. ¼	1877, '81, '85, '90, '95	120
do	69		1877, '81, '85, '90	160
do	83		1877, '81, '85, '95	160
do	84	N. ½ and S. E. ¼	1877, '81, '85, '95	120
do	90		1877, '81, '85, '90, '95	160
do	91		1877, '81, '85, '95	160
do	95		Conveyed*	240
do	96		1877, '81, '85	160
do	98		1877, '81, '85	160
do	101	Starch mill lot	1877	.05
do	115	N. E. ¼	1877, '81	40
do	121		1877, '81, '85, '90	160

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* John Brown farm.

ESSEX COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		OLD MILITARY TRACT, TOWNSHIP 12, THORN'S SURVEY — (*Continued*).		
North Elba	123		1877, '81, '85, '90, '95	160
do	126		1871, '77, '81, '85, '90, 1895	160
do	127		1881, '85	160
do	128		1881, '85	160
do	129		1877, '81, '85, '95	160
do	130		1871, '77, '81, '85, '90	160
do	131		1877, '81, '85, '90, '95	160
do	132		1877, '81, '85, '90, '95	160
do	134	N. W. ¼ & S. E. ¼	1877, '81, '85, '95	80
do	135		1871, '77, '81, '85, '90	160
do	136		1877, '81, '85, '90	160
do	137	S. ½ and N. W. ¼	1877, '81, '85, '95	120
do	138		1871, '77, '81, '85, '90, '95	160
do	139	W. end of N. ½	1871, '85	20
do	140	N. W. ¼	1881, '85	40
do	141		1877, '81, '85, '95	160
do	142	S. ½ and N. W. ¼	1877, '81, '85, '95	120
do	145	S. ½ and N. W. ¼	1885, '90, '95	120
do	146	N. ½ & S. E. ¼	1871, '85, '90, '95	120
do	147		1871, '77, '81, '85, '90, '95	160
do	148	N. ½ & S. E. ¼	1877, '81, '85, '95	120
do	149		1877, '81, '85	160
do	153		1877, '81, '85, '95	160
do	154		1871, '77, '81, '85	160
		Total, Township 12, Thorn's survey, 13,235.05 acres.		
		PARADOX TRACT,		
Ticonderoga	22		1881, '90	164
do	23		1881, '90	164
do	25		1881, '90	164
do	39		1877, '81, '85, '90	160
Schroon	55		Pur. 1908 & 1910	150

ESSEX COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		PARADOX TRACT — *Continued*)		
Schroon	70	Ex. 18a., S. E. cor. 15ch. E. & W. and 12 ch. N. & S.	Purchase 1909	160.40
do	76		Purchase 1909	160
do	81		1885	178.40
do	82		Pur. 1908 & '10	178.40
do	85	W. end 22.31 ch. wide ex. right of way of L. C. & S. R. R.	Conveyed in partition 1877 and '81	80
do	86		Pur. 1908 & 1910	160
do	88		1877,'81,'85,'90,'95.	160
do	89		1877, '81, '85	165.10
do	95		1871, '77, '81, '90	160
do	102		Original & 1900*	165.10
do	112		Pur. 1908 & 1910	150
do	113		Pur. 1980 & 1910	150
do	114		Pur. 1908 & 1910	150
do	115		Pur. 1908 & 1910	160
do	120	Und. 40a. of 60a. E. pt	Pur. 1908 & 1910	40
do	135		1871, '77, '81	160
N. Hudson	139		Conveyed 1904	114.40
do	140		1895, '00	110.80
do	141		1890	150
do	142	S. E. cor	Conveyed 1904 & 1910	45
do	144		1895, '00	122
do	145		1895, '00	122
do	146		Purchase 1907	122
Schroon	147		Original* & 1900	122
do	148		1885, '90	160
do	149		1885, '90	160
do	165		1885, '90	160
do	166		1885, '90, '95	160
N. Hudson	171		1890, '95	160
do	172	Und. ½	1877, '81, '85	84.30
do	174		1877, '81, '85	150
do	184		1877, '81, '85, '95	160
do	185		1877, '81, '85, '95	149.30
do	195		Pur. 1908 & '10	165.20
do	196		1895, '00	160
do	197		1890, '95, '00	160

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* Resale 1899.

ESSEX COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		PARADOX TRACT — (*Continued*)		
N. Hudson...	199		Conveyed 1904....	152
do ...	201		Purchase 1907....	160
do ...	203		Purchase 1907....	152.70
do ...	212	S. ½	Conveyed 1905 & '05, '10	80
do ...	217		1871,'77,'81,'85,'90.	160
do ...	218		Conveyed 1904 & '05	160
do ...	220		Pur. 1908 & 1910..	160
do ...	221		Pur. 1908 & 1910..	160
do ...	222		Pur. 1908 & 1910..	160
do ...	223		Pur. 1908 & 1910..	160
do ...	224		1871, '77, '81, '85..	165.20
do ...	230		Conveyed 1904....	160
do ...	231		Conveyed 1904....	160
do ...	232	Ex. 29a. N. of road and W. of brook	Purchase 1914....	131
do ...	234		Pur. 1907 & 1910..	160
do ...	235		Conveyed 1904 and pur. 1907 and 1910	160
do ...	236		Conveyed 1903 & pur. 1907 & 1910	160
do ...	237		Conveyed 1905 & '05, '10	160
do ...	238		Conveyed 1905 & '05, '10	160
do ...	239		1871,'77,'81,'10,'15.	160
Crown Point.	240		Purchase 1905....	160
do	241		Appropriated 1920.	160
do	242		Appropriated 1920.	149.40
do	247	Und. ⅛	1895, 1900	20.75
do	257		Appropriated 1920.	149.40
do	258		Appropriated 1920.	160.
do	259		Purchase 1905....	160
N. Hudson...	260		Purchase 1905....	160
do ...	261		1905, 1910	160
do ...	262		1905, 1910	160
do ...	263		Pur. 1907 & 1910..	160
do ...	266		Purchase 1909....	160
Moriah......	289		1885, '90	160
do	292		1871, '77, '81, '90..	160

ESSEX COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		PARADOX TRACT — (*Continued*)		
Moriah......	293	Ex. 80a. N. W. cor............	1871, '77, '81, '85, '95............	80
do	294	....	1871, '77, '81, '85, '90, '95.........	160
do	295	Ex. und. ⅔ of W. 110a..........	1871, '77, '81, '85, '90............	86.66
Crown Point.	297	....	1885, '90, '95.....	160
do	312	All of N. ½, in Schroon in 1857 & 1860, ex. und. ⅔.............	1890, '00.........	6.66
do	312	Und. ⅓ of S. ½.................	1895..............	26.66
Moriah......	314	....	1871, '77, '81, '85, '90, '95.........	160
do	315	....	1871, '77, '81, '95..	160
N. Hudson...	349	....	Pur. 1907 & 1910..	160
do ...	350	....	1871, '77, '81, '85, '90, '95.........	160
do ...	351	....	Conveyed 1903 & '05............	160
do ...	352	....	Conveyed 1903 & '05............	160
do ...	353	....	1871, '77, '81, 85..	167
do ...	354	....	1871..............	37.50
do ...	355	....	Purchase 1905.....	89.50
do ...	356	....	Pur. 1905 & 1910..	167
do ...	358	....	1871, '90, '95......	160
do ...	377	....	Pur. 1905 & 1910..	160
do ...	378	....	Pur. 1905 & 1910..	160
do ...	379	....	Conveyed 1905 & 1905, '00 and '10	184
do ...	380	....	Purchase, 1905....	189
do ...	381	Ex. mill & water power........	Mortgage..........	124.60
do ...	382	....	Mortgage..........	43
do ...	385	....	1885, '90.........	160
do ...	386	....	Pur. 1905 & 1910..	160
do ...	387	....	Pur. 1905 & 1910..	160
do ...	397	....	Pur. 1905 & 1910..	148.40
do ...	398	....	Pur. 1905 & 1910..	55.40
do ...	399	....	1881, '85.........	12
do ...	400	....	Mortgage..........	216.50
do ...	401	....	Mortgage & 1905, '10 & conveyed 1904...........	216.50

ESSEX COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		PARADOX TRACT — (*Continued*)		
N. Hudson	402		Mortgage & 1871 & conveyed 1903	156.60
do	403		Purchase 1905	169
Moriah	412		1871, '77, '81, '85, '90, '95	160
N. Hudson	413		1877, '81	160
do	414		1905, & 1910	160
do	416		Pur. 1905 & 1910	57
do	417		Purchase 1905	161
do	418		Purchase 1905	138.40
do	419		1881	138.40
do	420		Conveyed 1905 & '05	138.50
Moriah	422		1881	138.40
do	423		1881	138.40
N. Hudson	426	Ex. yard room and flowing ground	Mortgage	135.40
do	427		Pur. 1906 & 1871, '77, '81, '85, '05, '10	174
do	428		1885, '90	155.90
		Total, Paradox Tract, 17,347.73 acres.		
		PERU BAY TRACT		
Willsborough	76		Original & resale 1899	100
		ROARING BROOK TRACT,		
Elizabetht'n	1		Original*	117.40
do	2		Original*	243
do	5	All in Elizabethtown	1877, '81, '85, '90	134.50
Keene	5	All in Keene	1871, '77, '81	121.50
do	11		Original & resale 1867	240
do	12		Original & resale 1867	240
Elizabetht'n	16	All in Elizabethtown	1877, '81, '85	126
Keene	16	All in Keene	1877, '81, '85	114
Elizabetht'n	20		Original and 1900*	310

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* Resale 1899.

FRANKLIN COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		ROARING BROOK TRACT — (*Con.*)		
Elizabetht'n..	26	....	1877,'81,'85,'90,'95.	379
do ..	27	....	1881, '85.........	281
do ..	28	All in Elizabethtown...........	1877, '81, '85, '90..	147.50
Keene.......	28	All in Keene..................	1871, '77, '81, '85..	133.50
do	29	....	1877, '81, '85, '95..	281
do	30	....	1877, '81, '85.....	281
do	31	....	1853,'77,'81,'85,'95.	281
do	32	....	1853, '77, '81, '85..	281
do	38	....	1881, '85, '90.....	284
do	39	....	1871, '77, '81, '85..	284
do	41	....	1853, '71, '85, '90..	284
Elizabetht'n..	42	All in Elizabethtown...........	1877, '81, '85, '90..	149
Keene.......	42	All in Keene..................	1871, '77.........	135
Elizabetht'n..	43	....	1881, '85.........	284
do ..	48	All in Elizabethtown...........	1877, '85.........	136.50
Keene.......	65	All in Keene..................	1871, '77, '81.....	121.60
do	66	....	1877, '81, '85 and Conveyed in partition 1907......	256
do	68	Ex. 24a. S. of Lot 111, 750 ft. wide........................	Purchase 1919....	400.50
Elizabetht'n..	86	....	Original*.........	200
		Total, Roaring Brook Tract, 6,246 acres.		
		ROGERS (PLATT) & CO.'S ROAD PATENT,		
Schroon.....	Platt Strip	B'd N. by Oliver K. Knox, E. by Abner Squires, S. by lot 62 & W. by John Lewis, now Jno. Knox and the road to Hoffman..................	Purchase 1905....	20
do	Platt Strip	A part of Platt strip, b'd N. by lands formerly of Bartlett Seaman, E. by land formerly owned by Sewell Thornton, S. by Darius Squires & W. by land formerly occuped by Jeptha Knox...............	Purchase 1905....	39

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* Resale 1899.

ESSEX COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		ROGERS (PLATT) & CO.'S ROAD PATENT— (*Continued*)		
Schroon	1	Sub. 11	1890	118
do	1	Sub's 62, 63 & 64; all on the S. side of Platt Strip	Purchase 1905	95
do	2	B'd N. by Maurice O'Conel or M. O'Connell, and William Miller E. by Ann Albro, S. by Schroon Lake and Hoffman highway and W. by John Adkinson, Atkinson or Allison.	1890, '95	42
do	2	Bartlett Seaman lot bd. beg. at the S. E. cor. of the Jeptha Knox farm, th. S. 75½° E. 33c. to a hemlock tree, th. N. 14½° E. 33c., 33l. th. N. 75½° W. 33c., th. S. 14½° W. to beg.	Purchase 1905	100
do	2	B'd. beg. at N. E. cor. of lot 36, Hoffman, th. S. 72° E. 69c. 42l. to Jeptha Knox, th. S. 18° W. 13c. 5l. to S. side of said lot, th. N. 72° W. 69c. 42l to Hoffman Township and th. N. 18° E. 13c. 5l. to beg. 90.10a. ex. W. ½ thereof conveyed to Henry Ross	Purchase 1905	45.30
do	2	Beg. at beech tree the S. E. cor. of lot 6, or N. W. cor. of lot 61, th. N. 75½° W. 30c. to a stake and stones near a hemlock stump; th. N. 14½° E. 16c. 66l. th. S. 75½° E. 30c. to a hemlock tree, th. S. 14½° W. 16c. 66l. to beg.	Purchase 1905	50
do	2	B'd beg. at a stake in the outlet of Williams' Pond, the N. W. cor. of the James lot, th. S. 18° W. 38c. 18l. to a stake, th. N. 72° E. 2c. to a corner, th. S. 18° W. 17c. 20l. to the highway, th. N. 72° W. 17c. 25l. to the cor. of the Ross lot, th. N. 18° E. 30c. to Williams Pond, th. E. and N. along bank of Pond		

ESSEX COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		ROGERS (PLATT) & CO'S ROAD PATENT — (*Continued*) at high water mark, and down the outlet to the line of said lot 2, and th. E'ly along said line to beg., ex. so much as was conveyed to Layton Albro and Lewis Bullet	Purchase 1905	51
Schroon	3	N. W. part	Pur. 1905 & 1915	100
do	4	Sub. 2	Purchase 1905	111.65
do	4	Sub. 3	Purchase 1905	111.65
do	4	Sub. 4, Ex. 30½a. assessed to Knapp	1905	81.15
do	4	Sub. 6	Purchase 1905	111.65
do	4	Sub. 7	1885, '90	118.55
do	18	B'd beg. at S. E. cor. of lot th. N. 5° E. 10c. 66l. th. N. 85° W. 21c. 16l. th. S. 2c. th. W. along R. Braley's land, 5c. th. N. 3° E. 2c., th. N. 85° W. 2c. 34l. to the bank of Schroon river, at high water mark, th. down stream as it winds and turns to S. W. cor. of A. Harrington, th. N. 5° E. 2c. 75l. to N. W. cor. of said Harrington & th. E. on S. line of lot to beg.	1885	25.26
		Total Rogers (Platt) & Co.'s Road Patent, 1,220.21 acres.		
		SCHROON TRACT,		
do	1	Ex. 57¾a. W. part thereof, 15ch. 16l. wide on Lake	Pur. 1908 & 1910	....
do	2		Pur. 1908 & 1910	138.28
do	3		Pur. 1908 & 1910	144.75
do	4		Pur. 1908 & 1910	190.75
do	5		Pur. 1908 & 1910	190.25
do	6		Pur. 1908 & 1910	190.25
do	7		Pur. 1908 & 1910	190.25
do	8		Pur. 1908 & 1910	190.25
do	9		Pur. 1908 & 1910	190.25
do	10		Pur. 1908 & 1910	190.25
do	11		Pur. 1908 & 1910	190.25
do	12		Pur. 1908 & 1910	190.25

ESSEX COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		SCHROON TRACT — (*Continued*)		
Schroon.....	13	....	Pur. 1908 & 1910..	190.25
do	14	....	Pur. 1908 & 1910..	95
do	15	....	Pur. 1908.........	126.25
do	16	....	Pur. 1908 & 1910..	127.25
do	17	....	Pur. 1908 & 1910..	96
do	18	....	Pur. 1908 & 1910..	192
do	19	....	Pur. 1908 & 1910..	192
do	20	....	Pur. 1908 & 1910..	192
do	21	....	Pur. 1908 & 1910..	192
do	22	....	Pur. 1908 & 1910..	192
do	23	....	Pur. 1908 & 1910..	192
do	24	....	Pur. 1908 & 1910..	192
do	25	....	Pur. 1908 & 1910..	192
do	26	....	Pur. 1908 & 1910..	192
do	27	....	Pur. 1908 & 1910..	192.25
do	28	Ex. $55\frac{2}{100}$a. strip W. p't thereof 15 ch. 16l, wide, on Lake.....	Pur. 1908 & 1910..	79.98
do	29	....	Pur. 1908 & 1910..	158.25
do	30	....	Pur. 1908 & 1910..	169
do	31	....	Pur. 1908 & 1910..	160
do	32	....	Pur. 1908 & 1910..	160
do	33	....	Pur. 1908 & 1910..	160
do	34	....	Pur. 1908 & 1910..	160
do	35	....	Pur. 1908.& 1910..	160
do	36	....	Pur. 1908 & 1910..	160
do	37	....	Pur. 1908 & 1910..	160
do	38	....	Pur. 1908 & 1910..	160
do	39	....	Pur. 1908 & 1910..	160
do	40	....	Pur. 1908 & 1910..	186.25
do	41	....	Pur. 1908 & 1910..	186.25
do	42	....	Pur. 1908 & 1910..	160
do	43	....	Pur. 1909.........	160
do	44	....	Pur. 1909.........	160
do	45	....	Pur. 1909.........	160
do	46	....	Pur. 1909.........	160
do	47	....	Pur. 1908 & 1910..	160
do	48	....	Pur. 1908 & 1910..	160
do	49	....	Pur. 1908 & 1910..	160
do	50	....	Pur. 1908 & 1910..	160
do	51	....	Pur. 1908 & 1910..	169.25
do	52	Ex. $31\frac{2}{100}$a. strip W. part thereof, 15ch. 16l. wide, on Lake......	Pur. 1908 & 1910..	128.23

ESSEX COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		SCHROON TRACT—(*Continued*)		
Schroon......	53	Ex. 72.04a. strip W. pt. thereof 15ch. 16l. wide, on Lake......	Pur. 1908 & 1910..	4.71
do	54	Ex. 26a. strip on Lake and 28a. strip on Lake...............	Pur. 1908 & 1910..	74.00
do	55	....	Pur. 1908 & 1910..	169
do	56	....	Pur. 1908 & 1910..	160
do	57	....	Pur. 1908 & 1910..	160
do	58	....	Pur. 1908 & 1910..	160
do	59	....	Pur. 1908 & 1910..	160
do	60	....	Pur. 1908 & 1910..	160
do	61	....	Pur. 1908 & 1910..	160
do	62	....	Pur. 1908 & 1910..	160
do	63	....	Pur. 1908 & 1910..	160
do	64	....	Pur. 1908 & 1910..	160
do	65	....	Pur. 1908 & 1910..	186.25
do	66	....	Pur. 1908 & 1910..	186.25
do	67	....	Pur. 1908 & 1910..	160
do	68	....	Pur. 1908 & 1910..	160
do	69	....	Pur. 1908 & 1910..	160
do	70	....	Pur. 1908 & 1910..	160
do	71	....	Pur. 1908 & 1910..	160
do	72	....	Pur. 1908 & 1910..	160
do	73	....	Pur. 1908 & 1910..	160
do	74	....	Pur. 1908 & 1910..	160
do	75	....	Pur. 1908 & 1910..	160
do	76	....	Pur. 1908 & 1910..	169.25
do	77	Ex. 70a., strip on Lake.........	Pur. 1908 & 1910..	20
do	79	Ex. 75a. strip on Lake.........	Pur. 1908 & 1910..	108
do	80	....	Pur. 1908 & 1910..	160
do	81	....	Pur. 1908 & 1910..	160
do	82	....	Pur. 1908 & 1910..	160
do	83	....	Pur. 1908 & 1910..	160
do	84	....	Pur. 1908 & 1910..	160
do	85	....	Pur. 1908 & 1910..	160
do	86	....	Pur. 1908 & 1910..	160
do	87	....	Pur. 1908 & 1910..	160
do	88	....	Pur. 1908 & 1910..	160
do	89	....	Pur. 1908 & 1910..	186.25
do	90	....	Pur. 1908 & 1910..	186.25
do	91	....	Pur. 1908 & 1910..	160
do	92	....	Pur. 1908 & 1910..	160
do	93	....	Pur. 1908 & 1910..	160

ESSEX COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		SCHROON TRACT — (*Continued*)		
Schroon	94		Pur. 1908 & 1910	160
do	95		Pur. 1908 & 1910	160 00
do	96		Pur. 1908 & 1910	160
do	98	N. W. cor. 24½c. N. and S. bd. E. by the road	Pur. 1908	63
do	99		Pur. 1908 & 1910	160
do	102		Pur. 1908	147
do	103	W. end 21c. 70l. on N., and 25c. 30l. on S. line, 94a., ex. 33¾a. N. end thereof	Pur. 1908	60.25
do	106		Pur. 1908 & 1910	160
do	107		Pur. 1908 & 1910	160
do	108		Pur. 1909 & 1910	160
do	109		Pur. 1908 & 1910	160
do	110		Pur. 1908 & 1910	160
do	111		Pur. 1908 & 1910	186.25
		Total, Schroon Tract, 16,494.45 acres.		
		SHONNARD'S PATENT,		
do		Ex. 36 24/100a. W. pt. a strip of an average width of 15c. 16l. wide E. and W. b'd W. by the lake	Pur. 1908 & 1910	166.06
		SOUTH TRACT, (*Stower's Survey*)		
Lewis	2		1885, '90	178
do	6		1900, '05	188
do	7		1885, '05	188
do	8		1885	200
do	10		1885, '90	124
do	15		1885, '90	244
do	27		1877, '81, '95	232
do	31		1843	224
Jay	33		1877, '81, '85	128
		Total, So. Tract, 1706 acres.		
		SPLIT ROCK TRACT,		
Westport	10		Original & Mortgage	115.70
do	14	S. W. of highway	Mortgage	10
do	16	W. of highway	1890	121.60

ESSEX COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		SPLIT ROCK TRACT—(*Cont'd*)		
Westport....	20	....	1885.............	126.50
		Total, Split Rock Tract, 373.8 acres.		
		SUMNER VALE PATENT,		
Ticonderoga..	147	Sloan, Elizabeth: W. end bd. N. by Chas. G. Wicks & A. Lockwood, E. by G. N. Wicks and S. by Gore in said Tract; known as the Red Oxide Ore bed........................	1890.............	16
		TOTTEN & CROSSFIELD PURCHASE, TOWNSHIP 14, N. ½ AND S. E. ¼, (*Pond's Survey*)		
Minerva.....	4	All in Essex Co..............	1885, '90.........	158
do	5	....	1890, '95.........	160
do	6	....	1881, '85.........	160
do	7	S. pt. 32 ch. on E. line and 17 ch. on W. line..............	Pur. 1909.........	86
do	9	E. of river..................	1877, '81, '85, '90..	152
do	10	S. ½ E. of river................	1877, '81, '90......	45
do	11	N. of river..................	1877, '81, '85......	30
do	12	E. of river..................	1877, '81, '85......	222
do	13	E. of river..................	Pur. 1895 & 1900..	25
do	16	S. of river..................	Conveyed 1905 & 1905 & '10......	5
do	18	S. pt. bd. N. by McCullogh.....	1885, '90, '95.....	53
do	19	....	1881, '85.........	160
do	20	....	1877, '81, '85.....	160
do	21	All in Essex county............	1885, '90, '95.....	100
do	28	All in Essex county............	Conveyed 1904 & 1905 & '10......	28
do	29	All in Essex county............	1877, '85.........	156
do	30	N. E. ¼ and 30a S. E. cor.......	Pur. 1905 & 1877..	70
do	31	Strip 15 ch. wide across N. and W. ends of lot..............	Pur.1898&'85,'90..	97.50
do	41	S. of river..................	1877, '81, '85.....	15
do	42	All in Essex Co..............	1877,'81,'85,'90,'95.	101
do	43	Ex. 50a. N. W. cor...........	1885.............	110
do	44	All in Essex county............	1885.............	88
		Total, Twp. 14, 2,181.50 acres.		

ESSEX COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		TOTTEN & CROSSFIELD PURCHASE —(*Continued*) TOWNSHIP 16,		
Minerva.....	1	All in Essex Co...............	1885, '90, '95.....	500
do	2	All in Essex Co...............	1885, '90, '95.....	476
do	3	All in Essex Co...............	1885, '90, '95.....	494
do	4	All in Essex Co...............	1885, '90, '95.....	587
do	5	All in Essex Co...............	1885, '90, '95.....	688
do	6	All in Essex Co...............	1885, '90, '95.....	704
do	7	All in Essex Co...............	1885, '90, '95.....	801
do	8	N. 100a. and all of 317a. S. pt. in Essex Co. 304a...........	1885, 1890.........	404
do	13	....	1877,'81,'85,'90,'95.	1,000
do	14	All in Essex Co...............	1877,'81,'85,'90,'95.	922
do	15	All in Essex Co...............	1877,'81,'85.'90,'95.	768
do	16	N. W. ¼......................	1877,'81,'85,'90,'95.	250
do	17	N. W. ¼ All in Essex Co.........	1877,'81,'85,'90,'95.	173
		Total, Township 16, 7,767 acres.		
		TOTTEN & CROSSFIELD PURCHASE, TOWNSHIP 20, (*Pierson Survey*)		
do	A	S. E. part....................	Purchase 1891 and partition 1904...	2,400 00
do	C	....	Purchase 1891, Pur. 1906 and 1905, '10............	1,842.50
		Total, Township 20, 4,242.50 acres.		
		TOTTEN & CROSSFIELD PURCHASE, TOWNSHIP 25, BAILEY'S PATENT		
do	2	E. pt.........................	1877, '81, '85.....	70
do	3	....	1885, '90, '95.....	78
do	5	....	Purchase 1897....	78
do	6	....	1885, '90, '95.....	78
do	7	....	1885, '90, '95.....	78
do	8	....	1877, '81, '85.....	78
do	9	....	1877, '81, '85, '95..	78
do	10	....	Purchase 1897....	94
do	11	....	1877, '81, '85.....	128
do	14	....	1885, '90, '95.....	100

ESSEX COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		TOTTEN & CROSSFIELD PURCHASE, TOWNSHIP 25, BAILEY'S PATENT — (*Continued*).		
Minerva	15		1877, '81, '85	100
do	17		1877, '81, '85	100
do	22	S. ½	1885, '90, '95	50
do	30		1881, '85	117
do	37	W. ½	1877, '81, '85	50
do	46		1885, '90, '95	100
do	51		Pur. 1897 & 1905	123
do	53		Pur. 1897	100
do	54		1877,'81,'85,'90,'95.	100
do	60		Purchase 1898	100
do	61		Purchase 1907	100
do	64	W. ½	Purchase 1897	50
do	65	W. ½	Purchase 1898	50
do	67		1885, '90	100
do	68		Pur. 1906 & '05	100
do	69		1881, '85	100
do	70		Pur. 1900 & 1900	123
do	71		1881, '85	122
do	72		1881, '85	100
do	73		1881, '85	100
do	74	All in Essex Co	1871, '77, '81, '95	87
do	75	All in Essex Co	1871, '77, '81, '95	95
do	76		Purchase 1897	100
do	77		1885, '90, '95	100
do	78		1881, '85, '90	100
do	79		1877, '81, '85	100
		Total, Bailey's Patent, 3,327 acres.		
		TOWNSHIP 25, DOMINICK'S PATENT		
do	3	All in Essex county	1885, '90, '95	161
do	5	Ex. $75\frac{6}{10}$ a. N. W. cor. 27c. wide E. & W. & 28c. long N. & S. and 62a. S. E. cor. 20c. E. & W. & 31c. N. & S.	Purchase 1907	112.40
do	8		1885, '90, '95	200
do	9	All in Essex county	1885, '90	56
do	12	All in Minerva	Pur. 1907 & 1910	152
do	19		Purchase 1907	200
do	48	S. ½	1885, '90	100

ESSEX COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		TOTTEN & CROSSFIELD PURCHASE, TOWNSHIP 25, DOMINICK'S PATENT — (*Continued*)		
Minerva.....	52	....	1877, '85, '90, '95..	200
do	53	....	1877, '81, '85, '90..	200
do	54	W. ½..........................	1885, '90.........	100
do	57	....	1885, '90.........	200
do	58	....	1877, '81, '85, '90..	200
do	59	....	1885, '90, '95......	200
do	60	N. ½..........................	1885, '90.........	100
		Total, Dominick's Pat., 2,181.40 acres.		
		TOWNSHIP 25, THORN'S SURVEY,		
do	1	....	1877, '81, '85.....	113.75
do	2	....	1881, '85.........	97.50
do	3	....	1881, '85.........	98
do	4	....	1881, '85.........	130
do	5	....	1877, '81, '85......	130
do	6	....	1881, '85.........	105
do	7	....	1881, '85.........	90
do	8	....	1881, '85.........	90
do	9	....	1881, '85.........	120
do	10	....	1881, '85.........	120
do	11	....	1881, '85.........	140
do	12	....	1881, '85.........	120
do	13	....	1881, '85.........	120
do	14	....	1881, '85.........	160
do	15	....	Pur. 1897 & 1877, '81, '85.........	160
do	16	....	1885, '90, '95......	140
do	17	....	1881, '85.........	120
do	18	....	1885, '90.........	120
do	19	....	1881, '85.........	160
do	20	....	Purchase 1897.....	160
do	21	Ore Bed Lot.................	1881, '85.........	140
do	22	....	1885, '90, '95......	120
do	23	....	1877, '81, '85......	120
do	24	....	1877, 81, '85......	160
do	25	....	1881, '85.........	160
do	26	....	1885, '90, '95......	140
do	27	....	1885, '90, '95.....	120

ESSEX COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		TOTTEN & CROSSFIELD PURCHASE, TOWNSHIP 25, THORN'S SURVEY — (*Continued*)		
Minerva	28		1885, '90, '95	120
do	29	Ex. 24a. S. E. cor. 8c. wide N. & S. & 30c. long E. & W	1881, '85	136
do	30	Ex. 36a. S. pt. 9c. N. & S. & 40c. E. & W	1881, '85	124
do	31		1881, '85	140
do	32		Conveyed 1905, '05, '10	120
do	33		Conveyed 1905, '05, '10	120
		Total, Township 25, Thorn's Survey, 4,214.25 acres.		
		TOTTEN & CROSSFIELD PURCHASE, TOWNSHIP 26,		
do	1		Pur. 1893 & 1895, '00	264
do	2		1885, '90, '95	220
do	3		1885, '90, '95	220
do	4		Pur. 1894 & 1900	220
do	5		Pur. 1894 & 1900	220
do	6		Conveyed 1903 & 1900, '05	220
do	8		Pur. 1893 & 1890, '95, '00	240
do	9		Purchase 1897	240
do	10		Purchase 1893 & 1890, '95, '00	240
do	11		Pur. 1893 & 1895, '00	240
do	12		Pur. 1908 & 1905, '10	252
do	13		Conveyed 1903, '85 '90, '95, '05	210
do	14		1890, '95, '00	200
do	15		1881, '85, '95	200
do	16		1881, '85, '90, '95	200
do	17		1881, '85, '90, '95	200
do	18		1877, '81, '85	220

ESSEX COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		TOTTEN & CROSSFIELD PURCHASE, TOWNSHIP 26 — (*Continued*)		
Minerva	19		Pur. 1893 & 1895, '00	220
do	20		1877, '81, '85, '90	220
do	21		1877, '81, '85	220
do	22		Pur. 1894 & 1900	220
do	23		1885, '90, '95	220
do	24		1885, '90, '95	264
do	25		1877, '81, '90	192
do	26		1877, '81, '85, '90, '95	160
do	27		Pur. 1894 & 1900	160
do	28		1877, '81, '85, '95	160
do	29		1877, '81, '85, '95	160
do	30		Pur. 1893, conveyed 1903 and 1877, '81, '85, '95, '00	160
do	31		Pur. 1891 & 1895, '00	160
do	32		Conveyed 1903 & 1905	160
do	33		1881, '85	160
do	34		Pur. 1893 & 1890, '95, '00	160
do	35		1877, '81, '85	160
do	36		1881, '85, '90, '95	168
do	37		Pur. 1893 & 1890, '00	210
do	39		Purchase 1893	200
do	40		Pur. 1906 & 1905	200
do	41		Purchase 1898	200
do	42		Pur. 1893 & 1895, '00	200
do	43		1871, '77, '81, '85, '95	200
do	47		Pur. 1893 & 1890, '95, '00	200
do	48		1877, '81, '85, '95	240
do	49		Pur. 1898 & 1881, '85, '95	240
do	50		Pur. 1893 & 1890, '95, '00	200

ESSEX COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		TOTTEN & CROSSFIELD PURCHASE, TOWNSHIP 26 — (*Continued*)		
Minerva.....	52	Ex. 33a. N. E. cor. 15c. N. & S. & 22c. E. & W................	1877, '81, '85.....	167
do	53	Ex. 21a. N. W. cor., 15c. N. & S. & 14c. E. & W.............	1877, '81, '85, '90, '95.............	179
do	54	....	1885, '90, '95......	200
do	55	....	1885, '90, '95......	200
do	56	....	Pur. 1893 & 1890, '95, '00.........	200
do	57	....	1877, '81, '85......	200
do	58	....	1871, '77, '81, '90..	200
do	59	....	1885, '90, '95......	200
do	60	....	1885, '90, '95......	210
do	61	....	Pur. 1906 & 1905..	210
do	62	....	1877, '81, '85......	200
do	63	....	1885, '90, '95......	200
do	64	....	Pur. 1906 & 1905..	210
do	65	....	1885, '90, '95......	200
do	66	....	1877, '81, '85......	200
do	67	....	1877, '81, '85......	200
do	68	....	1877, '81, '85......	200
do	69	....	Pur. 1893 & 1890, '95, '00.........	200
do	70	....	1885, '90, '95......	200
do	71	....	1881, '85..........	200
do	72	....	1885, '90..........	240
do	73	....	Pur. 1893 & 1895, '00............	293
do	74	....	1877, '81, '85......	244
do	75	....	Pur. 1894 & 1890, '00.............	244
do	76	....	1881, '85, '95......	244
do	77	....	Pur. 1894 & 1890, '00.............	244
do	78	....	1877, '81, '85......	244
do	79	....	Pur. 1893 & 1890, '95, '00.........	244
do	80	....	1885, '90, '95......	244
do	81	....	1877, '81, '85......	244
do	82	....	1877, '81, '85, '90, '95.............	244

ESSEX COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		TOTTEN & CROSSFIELD PURCHASE, TOWNSHIP 26 — (*Continued*)		
Minerva	83		1885, '90, '95	244
do	84		1877, '81, '85, '90, '95	256
do	85		Pur. 1893 & 1890, '95, '00	247.40
do	86	Ex. 74a. S. part	Purchase 1908	162
do	88		Pur. 1893 & 1890, '95, '00	236
do	89		1877, '81, '85, '95, '00	236
do	90		1885, '90, '95	236
do	91		Pur. 1893 & 1890, '95, '00	236
do	92		1871, '77, '81, '85, '90, '95	236
do	93		1877, '81, '85	236
do	94		1877, '81, '85	236
do	95		Pur. 1894 & 1900	236
do	96		1881, '85	283
do	97	Ex. 183a. N. pt. (W. H. Halsted)	1885, '90, '95	100
do	98		1877, '81	236
do	99		1877, '81, '85, '90, '95	236
do	100		Pur. 1897 & 1905	236
do	101		1877, '81, '85	236
do	102	Ex. 100a. N. pt. & 50a. N. W. cor. of remainder	1877, '81, '85, '95	86
do	103		Pur. 1908 & 1881, '85, '95, '00	236
do	104	N. E. part	1877	113
do	105	N. W. pt	1881, '85	50
do	106	S. pt	1881, '85	76
do	107		Pur. 1893 & 1890, '95, '00	236
do	109		1877, '81, '85	247.80
do	110		Pur. 1897 & 1881, '85	236
do	111		Pur. 1897 & 1906, & 1895, '00, '05	236
do	112		Pur. 1898 & 1900, '05	236

ESSEX COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		TOTTEN & CROSSFIELD PURCHASE, TOWNSHIP 26 — (*Continued*)		
Minerva.....	113	S. E. cor. 25c. N. & S. & 8c. 451. E. & W..................	1900.............	21.13
do	114	....	1877, '81, '85......	236
do	115	....	Conveyed in partition, 1902 & 1890, 1905......	236
do	116	....	Pur. 1893 & 1890, '95, 1900.......	236
do	117	....	Pur. 1892 & 1877, '81, '85.........	236
do	118	S. pt. 126a. & 15a. N. W. cor. sq. of all that remains after ex. 60a. N. pt. of lot...............	1871, '81, '85, '95..	141
do	119	....	Pur. 1893 & 1890, '95, '00.........	236
do	120	....	Conveyed 1903 & 1905, '10.......	283
		Total, Township 26, 23,427.33 acres.		
		TOTTEN & CROSSFIELD PURCHASE TOWNSHIP 27, *Richards' Survey,*		
Newcomb....	6	....	1877, '81, '85, '90..	233
do	7	....	1877, '81.........	250
do	14	....	1877, '81, '85, '90..	160
do	15	....	1877, '81, '85......	160
do	21	....	1877, '81.........	160
do	22	....	1877, '81, '85.....	160
do	23	....	1877, '81, '85, '95..	160
do	25	....	1877, '81, '85......	160
do	26	....	1877, '81, '85, '95..	160
do	27	....	1877, '81, '85, '95..	160
do	28	....	1877, '81, '85.....	160
do	32	....	1885, '90, '95......	160
do	33	....	1881, '85.........	160
do	36	N. E. cor...................	1871, '77, '81, '85..	70
do	37	....	1877, '81, '85......	250
		Total, Richards' survey, 2,563 acres.		

ESSEX COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		TOTTEN & CROSSFIELD PURCHASE, TOWNSHIP 27 *Thorn's Survey,*		
Newcomb	10		Purchase 1893	68.12
do	11		Purchase 1893	68.12
do	12		Purchase 1893	68.12
do	13		Purchase 1893	68.12
do	14		Purchase 1893	68.12
do	16		1871, '77, '81, '90,	80
do	17	Ex. 55a. N. W. cor	1877, '81, '85	25
do	18		1877, '81, '85	80
do	19		1877, '81, '85, '90, '95	80
do	23		1877, '81, '85	160
do	24		1877, '81, '85	160
do	26		Purchase 1893	160
do	27		Purchase 1893	160
do	28		Pur. 1906 & 1905, '10	160
do	29		Pur. 1906 & 1905, '10	160
do	32		1885, '90, '95	160
do	33		1871, '77, '81, '85, '90	160
do	34		1885, '90	160
do	35		1877, '81, '85	160
do	36		1877, '81, '85	160
do	37		Purchase 1893	160
do	38		Pur. 1906 & 1905, '10	160
do	39		Pur. 1906 & 1905, '10	160
do	41	N. W. cor	1885, '90	70
do	42		1877, '81, '85	160
do	43		1877, '81, '85	160
do	44		1877, '81, '85	160
do	45		1877, '81, '85	160
do	46		1877, '81, '85	160
do	47		1877, '81, '85	160
do	48		1877, '81, '85	160
do	49		1877, '81, '85	160
do	50		Purchase 1895	132
do	51		1877, '81, '85	160
do	52		1877, '81, '85	160

ESSEX COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		TOTTEN & CROSSFIELD PURCHASE, TOWNSHIP 27, THORN'S SURVEY — (*Continued*)	.	
Newcomb....	53		1877, '81, '85......	160
do	54		1877, '81, '85......	160
do	55		1877, '81, '85......	160
do	56		1877, '81, '85......	160
do	57		1877, '81, '85......	160
do	58		1877, '81, '85......	160
do	59		1877, '81, '85......	160
do	60		1885, '90..........	132
do	61		1877, '81, '85......	160
do	62		1877, '81, '85......	160
do	63		1877, '81, '85......	160
do	64		1877, '81, '85......	160
do	65		1877, '81, '85......	160
do	66		1877, '81, '85......	160
do	67		1877, '81, '85......	160
do	68		1877, '81, '85......	160
do	69		1877, '81, '85......	160
do	70		Purchase 1895.....	132
		Total Township 27, Thorn's survey, 7,471.60 acres.		
		TOTTEN & CROSSFIELD PURCHASE, TOWNSHIP 28,		
do	...	N. E'ly part of the parallelogram	Pur. 1895 & 1900..	741
do	...	N. W. by part of the parallelogram ex. lots 84, 85 & 86....	Pur. 1895 & 1895, '00.............	750.95
do	84		Pur. 1895 & 1895, '00.............	189.70
do	85		Pur. 1895 & 1895, '00.............	168
do	86	N'ly p't.....................	Pur. 1895 & 1895..	101.28
		Total, Township 28, 1,950.93 acres.		
		TOTTEN & CROSSFIELD PURCHASE, TOWNSHIP 30,		
Minerva.....	1		Conveyed 1901 & 1877, '81, '85, '90	1,050
do	2		Conveyed 1901 & 1877, '81, '85...	1,050

ESSEX COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		TOTTEN & CROSSFIELD PURCHASE, TOWNSHIP 30, — (*Continued*)		
Minerva.....	3	....	Pur. 1901 & 1900, '05............	1,050
do	4	Ex. 15a. S. E. cor. (Lynch).....	Pur. 1901 & 1900, '05............	1,035
do	5	....	Conveyed 1901 & 1871, '77, '81, '85.	1,050
Minerva and N. Hudson...	6	....	Conveyed 1901 & 1877, '81, '85...	1,050
Minerva.....	7	All in Minerva................	Conveyed 1901 & 1877, '81, '85...	787.50
N. Hudson...	7	All in North Hudson...........	Purchase 1897.....	262.50
do ...	8	All in North Hudson...........	Purchase 1897....	630.
Minerva.....	8	All in Minerva................	Conveyed 1901 & 1877, '81, '85...	420
Minerva and N. Hudson...	9	....	Conveyed 1901 & 1877, '81, '85...	1,050
N. Hudson...	10	....	Purchase 1901 & 1877, '81, '85, '00, '05............	1,050
do ...	11	....	Conveyed 1901 & 1877, '81, '85...	1,050
do ...	12	....	Conveyed 1901 & 1877, '81, '85...	1,050
do ...	13	....	Purchase 1901 & 1877, '81, '85...	1,050
do ...	14	N. end.......................	Pur. 1901 & 1900, '05............	850
Minerva and N. Hudson...	15	....	Conveyed 1901 & 1877, '81.......	1,050
do ...	16	....	Conveyed 1901 & 1877, '81, '85...	1,050
N. Hudson...	17	All in North Hudson...........	Conveyed 1901 & 1877, '81, '85...	300
Minerva.....	17	All in Minerva ex. 7a (Myra J. La Bier)..................	Purchase 1901....	743
Minerva and N. Hudson...	18	....	Conveyed 1901 & 1877, '81, '85...	1,050

ESSEX COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		TOTTEN & CROSSFIELD PURCHASE, TOWNSHIP 30 — (*Continued*)		
N. Hudson...	19	....	Conveyed 1901 & 1877, '81......	1,050
do ...	20	....	Conveyed 1901 & 1877, '81, '85...	1,050
do ...	21	....	Conveyed 1901 & 1877, '81.......	1,050
Minerva.....	22	....	Conveyed 1901 & 1877, '81, '85...	1,050
do	23	....	Conveyed 1901 & 1877, '81, '85...	1,050
do	24	....	Purchase 1901 & 1877, '81, '85...	1,050
		Total, Township 30, 24,978 acres.		
		TOTTEN & CROSSFIELD PURCHASE, TOWNSHIP 44,		
N. Hudson...	4	Sub. 1....................	Purchase 1900....	128.25
do ...	4	Sub. 2......................	Pur. 1909 & 1915..	120
do ...	4	Sub. 3......................	Pur. 1909 & 1915..	120
do ...	4	Sub. 4, ex. 1½ acres, Sch. House lot & ex. 50a. S. pt..........	Purchase 1900....	68.50
do ...	4	Sub. 5......................	Pur. 1909 & 1915..	120
do ...	4	Sub. 6......................	Pur. 1909 & 1915..	120
do ...	4	Sub. 8......................	Pur. 1909 & 1915..	120
do ...	4	Sub. 9......................	Pur. 1909 & 1915..	120
		Total, Township 44, 916.75 acres.		
		TOTTEN & CROSSFIELD PURCHASE, TOWNSHIP 45,		
Newcomb....	14	All in Newcomb...............	Pur. 1897 & 1881..	491
N. Hudson...	14	All in North Hudson...........	Purchase 1897....	23
Keene.......	33	Und. [illegible] of all in Keene........	Pur. 1908 & 1910..	349.30
N. Hudson...	33	Und. [illegible] of all in N. Hudson....	Pur. 1908 & 1910..	57.60
Keene.......	36	....	Pur. 1908 & 1910..	514
do	37	....	Pur. 1908 & 1905, '10............	514
do	38	....	1881, '85.........	514

ESSEX COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		TOTTEN & CROSSFIELD PURCHASE, TOWNSHIP 45 — (*Continued*)		
Keene	39	All in Keene	Pur. 1908 & 1881, '85	197
Newcomb	39	All in Newcomb, ex. so much of 100a. S. E. cor. of lot as is not in Keene	Pur. 1908 & 1905	257
Keene	47	All in Keene	Pur. 1908 & 1905	450
Newcomb	47	All in Newcomb	Pur. 1908 & 1905	64
Keene	48	Und. $\frac{3}{4}$ $\frac{5}{8}$	Pur. 1908 & 1905, '10	406.60
		Total, Township 45, 3,837.50 acres.		
		TOTTEN & CROSSFIELD PURCHASE, TOWNSHIP 46,		
Newcomb	9		1885, '90	252.
		TOTTEN & CROSSFIELD PURCHASE, TOWNSHIP 47,		
Newcomb		All in Cold River watershed S. of Brodhead line ex. 202a. flow land	Pur. 1907 & 1905	13,442.63
		TOTTEN & CROSSFIELD PURCHASE, TOWNSHIP 49,		
N. Hudson	1		Purchase 1898	1,050
do	2	W. part	Purchase 1898	665
do	3	N. E. cor. bd. S. by Pepper, & S. W. by Walker	Purchase 1897	300
do	4	E. end bd. N. by Schroon River	1885	30
do	4	E. end ex. 30a. bd. N. by Schroon River	1905, 1910	203
do	5		Pur. 1898 & 1885, '90 & '95	1,050
do	6	Ex. 42a. S. W. cor. (Walker)	Purchase 1898	1,003
do	7	Ex. 194a. N. E. part	Purchase 1898	852
do	8		Pur. 1899 & 1900	1,050
do	9		Purchase 1898	1,050
do	10		Pur. 1898 & 1900	1,050
do	11		Pur. 1898 & 1900	1,050

ESSEX COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		TOTTEN & CROSSFIELD PURCHASE, TOWNSHIP 49 — (*Continued*)		
N. Hudson...	12	....	1885, '90, '95......	1,050
do ...	13	....	Purchase 1895.....	1,050
do ...	19	....	Purchase 1898.....	1,050
do ...	21	All in N. Hudson..............	Purchase 1898.....	442.50
Keene........	21	All in Keene..................	Purchase 1898.....	607.50
		Total, Township 49, 13,533 acres.		
		TOTTEN & CROSSFIELD PURCHASE, TOWNSHIP 50,		
Newcomb....		Gore, unallotted N. end, all thereof in Essex county......	Original and conveyed 1904.....	650.00
do	59	All in Essex county............	Conveyed 1903....	17.75
do	60-61	All in Essex county............	Purchase 1900.....	132.50
do	65	All in Essex county............	Purchase 1900.....	71.40
do	66	All in Essex county............	Pur. 1900 & 1905..	2
do	76	All in Essex county............	Purchase 1900....	10.45
do	77	All in Essex county............	Purchase 1900....	115.68
do	87	All in Essex county............	Con. 1904 & 1910..	141
do	88	All in Essex county............	Conveyed 1891....	40
do	91	All in Essex county............	Pur. 1900 & 1900..	15.50
do	92	All in Essex county............	Con. 1901 & 1910..	69
do	95	....	1877, '81, '85......	140
do	96	....	1877, '81, '85......	140
do	97	....	1877, '81, '85......	140
do	98-99	....	1877, '81, '85......	173
do	103	....	1877,'81,'85,'90,'95.	180
do	104	....	1877, '81, '85, '90, '95............	180
do	105	....	1877, '81, '85, '90, '95............	180
do	106	....	1877, '81, '85, '95..	180
do	107	Ex. 50a. S. W. cor............	Pur. 1901 & 1900..	88.87
do	108	....	1877, '81, '85, '90, '95............	183
do	109	....	1877, '81, '85, '90, '95............	160
do	110	....	1877, '81, '85, '90, '95............	160

ESSEX COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		TOTTEN & CROSSFIELD PURCHASE, TOWNSHIP 50 — (*Continued*)		
Newcomb	111		1877, '81, '85	160
do	112		1877, '81, '85	160
do	115–16		1877, '81, '85	299
do	117		1877, '81, '85, '90, '95	236
do	118		1877, '81, '85, '90, '95	236
do	119		1877, '81, '85, '90, '95	236
do	120		1877, '81, '85, '90, '95	236
do	121		1877, '81, '85, '95	101
		Total, Township 50, 4,834.15 acres.		
		TRACT WEST OF ROAD PATENT,		
N. Hudson	1		Purchase 1898	148
do	2		Purchase 1898	176
do	4		1877, '81, '85, '90, '95	160
do	5		1877, '81, '85, '90, '95	152
do	6		1890, '95	76
do	7		1881, '85	68.50
do	8		Pur. 1905 & 1910	149.10
do	10		1871, '77, '81, '85, '90, '95	160
do	11		1871, '77, '81, '85, '90, '95	164.40
do	13		Pur. 1905 & 1910	160
do	14		Purchase 1905	160
do	15		1895, '00	160
do	16		Purchase 1897	160
do	19		Purchase 1897	160
do	24		Purchase 1897	156.30
do	27		Pur. 1909 & 1877, '81, '15	160
do	28		Pur. 1909 & 1877, '81, '15	160

ESSEX COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		TRACT WEST OF ROAD PATENT — (*Continued*)		
N. Hudson...	29	....	Pur. 1909 & 1877, '81, '15.........	160
do ...	30	....	Purchase 1897....	160
do ...	31	....	Purchase 1897....	160
do ...	33	....	1881, '85.........	168.40
do ...	34	....	1881, '85.........	160
do ...	35	....	1877, '81, '85......	160
do ...	36	....	1881, '85.........	160
do ...	37	....	1881, '85.........	160
do ...	38	....	Pur. 1891 & 1895..	160
do ...	39	....	Pur. 1891 & 1895..	160
do ...	40	....	1881, '95.........	160
do ...	41	....	Purchase 1907....	159.30
do ...	42	North end..................	Pur. 1909 & 1910..	80
do ...	43	....	1877, '85.........	160
do ...	44	....	Purchase 1898.....	160
do ...	45	....	Purchase 1898....	160
do ...	46	....	Purchase 1907....	160
do ...	47	....	1877, '81, '85......	160
do ...	51	....	1885, '90.........	160
do ...	52	....	1885, '90.........	119.30
do ...	53	....	1885, '90.........	228.50
do ...	54	....	1881, '85, '90......	160
do ...	55	....	1885, '90.........	160
do ...	59	....	Purchase 1907....	160
do ...	60	....	Purchase 1907....	160
do ...	61	....	Purchase 1907....	160
do ...	62	....	Purchase 1897....	160
Schroon.....	65	....	1877, '81, '85, '95..	127.80
do	67	....	1877, '81, '85......	160
do	68	....	Purchase 1907.....	160
do	71	Und. ½......................	1885, '90, '95......	80
do	72	Und. ½......................	1885, '90.........	80
do	73	....	1881, '85, '90......	160
do	74	....	1881, '85, '90.....	160
do	75	....	1881, '85, '90.....	160
do	76	....	1885, '90.........	168
do	77	....	1885, '90.........	171
do	78	....	1885, '90.........	165.60
do	79	....	1885, '90.........	168.40
do	80	....	1885, '90.........	181.60

ESSEX COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		TRACT WEST OF ROAD PATENT — (*Continued*)		
Schroon	81		1885, '90	168.20
do	82		1881, '85, '90	160
do	85	Und. ½	1885, '90, '95	80
do	86	Und. ½	1885, '90, '95	80
do	88		Purchase 1907	160
do	89		Purchase 1892	160
do	90		Purchase 1892	160
do	91		1881, '85, '90	116.10
do	93		1881, '85, '90	120
do	94		1885, '90	160
do	100		1885, '90	160
do	101		1881, '85, '90	160
do	102		1885, '90	168.20
do	103		1885, '90	181.60
do	104		1885, '90	148.50
do	105		1881, '85, '90	115
do	106		1885, '90	158
do	110		Pur. 1898 & 1905	160
do	111		Purchase 1905	160
do	112		Purchase 1892	160
do	113		1877, '81, '85, '90	120
do	117		1881, '85, '90	160
do	118		Pur. 1900 & 1895	160
do	119		Pur. 1898 & 1900	155
do	120		Purchase 1891	143
do	121		Pur. 1898 & 1900	157
do	122		Purchase 1905	156.70
do	123		Pur. 1908 & 1910	156.70
do	129		1885, '90	160
do	130		Purchase 1901	160
do	131		Original & 1900*	105.80
do	132		Pur. 1907 & 1885, '90	95
do	133		Original & 1900*	137
do	134		1881, '85, '90	180.80
do	135		Pur. 1907 & 1910	160
do	138		1881, '85, '90	96
do	139		1881, '85, '90	50.80
do	141		1881, '95	83
do	142		1881, '85, '90	74.80

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* Resale, 1899.

ESSEX COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		TRACT WEST OF ROAD PATENT — (*Continued*)		
Schroon.....	143	....	1885, '90.........	28.60
do	146	....	1885, '90.........	30.60
do	147	....	1881, '85, '90......	86.50
do	148	....	1881, '85, '90......	155.10
Minerva.....	149	....	1881, '85, '90, '95..	157
do	150	....	1885, '90.........	159
do	151	....	1881, '85.........	141
do	152	....	1881, '85.........	182
do	153	....	1885, '90.........	161.90
do	154	....	Purchase 1897....	157
do	155	....	Purchase 1897.....	175.60
do	156	....	1881, '85.........	144
do	157	....	1890.............	160
do	158	All in Minerva................	Purchase 1897....	80
Schroon.....	158	All in Schroon................	Purchase 1897....	80
do	159	....	Pur. 1905 & 1910..	90.75
do	160	....	Purchase 1897.....	83.60
Minerva.....	161	All in Minerva................	1885, '90.........	100
Schroon.....	161	All in Schroon................	1885, '90.........	60
Minerva.....	162	....	1885, '90.........	146
do	163	....	1881, '85.........	167.60
do	164	....	Purchase 1897....	152
do	165	....	1885, '90.........	157
do	166	....	1881, '85.........	167.60
do	167	....	Purchase 1897....	152
do	168	All in Minerva................	1877, '81, '85......	60
Schroon.....	168	E. part in Schroon.............	1877.............	60
do	169	N. part of all in Schroon.......	Purchase 1897.....	53
Minerva.....	171	....	Purchase 1897....	157
do	175	....	Purchase 1905....	120.30
do	178	....	Original..........	0.53
Schroon.....	...	Gore W. of Lots 120, 131 & 175.	Original..........	77
		Total, Tract West of Road Patent, 17,821.08 acres.		
		WENDELL'S (JOHN) LOCATION		
Ticonderoga..	.....	All..........................	Purchase, 1908....	400
		WHITE FACE MOUNTAIN TRACT,		
North Elba..	II	All in N. Elba S. of river.......	Conveyed in partition 1899 & '77, '81, '05........	569.80

ESSEX COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		WHITE FACE MOUNTAIN TRACT — (*Continued*)		
Wilmington..	II	All in Wilmington S. of river....	Conveyed in partition 1899 & 1877, '81, '85...	188.20
do ..	V	All in Wilmington.............	Conveyed in partition 1899 & 1877, '81, '85...	141.12
North Elba..	V	All in N. Elba ex. 787a. S. pt...	Conveyed in partition, 1899 & 1877, '81, '85, '05	1,274.88
		Total, White Face Mountain Tract, 2,174 acres.		
		WATERS,		
Chesterfield.......		Auger Lake....................	Original..........	345
do		Butternut Pond...............	Original..........	132
		Lake Champlain, all in Essex Co.	Original..........	50,432
Ticonderoga.......		Lake George, all in Essex Co....	Original..........	512
Schroon..........		Schroon Lake, all in Essex Co..	Original..........	2,432
		Total, Waters, 53,853 acres.		

FRANKLIN COUNTY

(*Total number of acres*, 171,178.37.)

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		GORE EAST OF TOWNSHIP 9, OLD MILITARY TRACT,		
Franklin	1		1900, '05	200
do	2	E. part	1900, '05	75
do	4		1900, '05	160
do	5		1900, '05	160
do	6		1900, '05	160
do	7	S. ½ & N. E. ¼	1900, '05	127.25
Bellmont	8	All in Bellmont	1877, '81, '85	103
Franklin	8	All in Franklin	1885, '90	57
Bellmont	28		1877, '81, '85	182.40
do	29	All in Bellmont	1900, '05	122.77
Franklin	29	All in Franklin	1900, '05	67.23
do	30		1900, '05	192.66
do	31		1900, '05	200
do	32		1900, '05	194
do	33		1900, '05	198.20
do	34		1900, '05	172.50
do	35		1900, '05	172
do	36		1900, '05	238.83
		Total, 2,782.84 acres.		
		GORE EAST OF TOWNSHIP 12, GREAT TRACT 1, MACOMB'S PURCHASE.		
Duane	1		1885, '90	44
do	2	N. part	1885, '90	27.25
do	3	S. pt	1885, '90	25.70
do	4	Ex. 9a. S. end	1885, '90	62.78
do	5	All S. of Turnpike	1885, '90	56
do	6		1885, '90	78
do	7		1885, '90	80
		Total, 373.73 acres.		
		MACOMB'S PURCHASE, GREAT TRACT 1, TOWNSHIP 1,		
Bombay	111	Jas. H. Sargent or Starch Factory Lot	1910, 1915	.50

FRANKLIN COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		MACOMB'S PURCHASE, GREAT TRACT 1 — (*Continued*) TOWNSHIP 6,		
Malone......	43	B'd N. by land of James B. Hanna, E. by highway, S. by Roger Desotelle & W. by Mitchell Samica or Lamica...	1890, '95.........	20
		GREAT TRACT 1, TOWNSHIP 8,		
Brandon.....	22	S. ½ of S. E. ¼.................	1866.............	25
do	45	B'd N. by land of A. Cambell, E. by Hinman & Harmon, S. by L. Brown & W. by lot line..	1877.............	15
do	55	B'd N. & E. by land of Webster & Co., S. by Thomas & W. by lot line..................	1895, '00.........	12.50
do	55	B'd N. S. & W. by land of Webster & Co. & E. by Adams & Kery..............	1895, '00.........	30
do	55	N. W. Cor. (Boardway)........	1915.............	12.28
do	71	On N. line of lot 9¾ c. W. of N. E. cor. 20c. long N. & S., 15¼c. wide E. & W..........	1895, '00.........	25
do	98	S. W. cor. square.............	1900.............	2
do	122	....	1895, '00.........	134
		Total, Township 8, 255.78 acres.		
		GREAT TRACT 1, TOWNSHIP 11,		
Santa Clara..	2	Sub. 2......................	1877, '81, '85.....	66
		GREAT TRACT 1, TOWNSHIP 12,		
Duane.......	3	N. E. cor. b'd S. by Ladd or Wells, and W. by Taggert or Wells.....................	1877, '81, '85....	100
Duane.......	4	N. ⅔ ex. Berry lot............	1877, '81, '85, '90..	395
do	6	N. E. cor., 142a. & S. W. cor., 200a.......................	1877, '81, '85.....	

FRANKLIN COUNTY

Town	Lot	DESCRTIIPON	Source of title and tax sale	Acres
		MACOMB'S PURCHASE, GREAT TRACT 1, TOWNSHIP 12—(*Con.*)		
Duane.......	7	All E. of highway ex. 117a. S. W. part.......................	1877, '81, '85......	387
do	8	....	1877, '81, '85......	456
do	11	S. W. Cor. rectangle...........	1881.............	10
do	13	....	1877, '81, '85, '95..	616
do	14	S. W. cor. rectangle............	1890, '95..........	50
do	16	....	1877, '81, '85......	442
do	18	On N. line, N. of turnpike, middle part.................	1895.............	30
do	19	10a. N. W. cor. and all S. of turnpike ex. Roberts lot......	1877, '81, '85, '95..	212
do	21	Sub. 2......................	1877, '81, '85......	104
do	21	Sub. 3......................	1877, '81, '85......	104
do	22	Sub. 1......................	1871, '77, '81......	96
do	23	Sub. 3......................	1881, '85..........	115
do	24	Ex. 200a. W. pt..............	1877, '81, '85, '10..	266
do	29	S. $\frac{1}{2}$........................	1877, '81, '85, '95..	338
do	30	Ex. 50a. N. E. cor. & ex. 16a. N. W. cor.................	1877, '81, '85......	499
do	31	All S. W. of turnpike & 40a. E. pt. b'd W. by Malone road...	1871, '77, '81, '85..	190
do	36	....	1877, '81, '85......	684
do	37	....	1877, '81, '85, '95..	631
		Total, Township 12, 6,067 acres.		
		GREAT TRACT 1, TOWNSHIP 14, S. $\frac{1}{2}$ & N. E. $\frac{1}{4}$ (Nathan Ward's Subdivision)		
Santa Clara..	55	Middle $\frac{1}{5}$ E. & W. across lot....	Purchase 1909....	37.50
do ..	68	N. $\frac{1}{5}$ & N. $\frac{1}{2}$ of S. $\frac{3}{5}$...........	1877, '81, '90......	73.20
do ..	73	N. $\frac{3}{4}$........................	1877, '81, '85, '95..	125.25
do ..	77	N. $\frac{1}{5}$ & N. $\frac{1}{2}$ of S. $\frac{2}{5}$ ex. $1\frac{6}{10}$a occupied by R. R...........	1877, '81, '85, '95..	71.60
do ..	78	N. $\frac{1}{2}$ of S. $\frac{3}{5}$..................	1877, '81, '85, '95..	37.60
do ..	86	N. $\frac{1}{2}$ & S. $\frac{1}{4}$..................	1871, '77, '81, '85..	127
do ..	100	S. $\frac{1}{4}$........................	1871, '77, '81, '90..	37.25
do ..	106	N. $\frac{1}{5}$ of S. $\frac{2}{5}$................	1877, '81, '85, '95..	109.20
do ..	107	....	1877, '81, '85, '95..	129
		Total Township 14, 747.60 acres.		

FRANKLIN COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		Macomb's Purchase, Great Tract 1 — (*Continued*) Township 15,		
Duane......	.....	N. W. ¼, S. part, 1,987a. ex. 750a. W. end thereof....................	Purchase 1899 & 1877, '81, '85....	1,237
		South West ¼,		
Brighton.....	7	....	1877, '81, '85.....	103
do	8	....	1877, '81.........	103
do	9	....	1877, '81.........	103
do	10	....	1877, '81.........	135
do	14	....	1877, '81, '85.....	109
do	15	....	1877, '81, '85.....	108
do	16	....	1877, '81.........	108
do	17	....	1877, '81.........	108
do	18	....	1877, '81.........	108
do	19	....	1877, '81.........	108
do	20	....	1877, '81.........	130
do	24	....	1877, '81.........	104
do	25	....	1877, '81, '85, '95..	104
do	26	....	1877, '81.........	104
do	27	....	1877, '81.........	104
do	28	....	1885, '90.........	104
do	29	....	1885, '90.........	105
do	36	....	1877, '81.........	100
do	37	....	1877, '81.........	100
do	38	....	1877, '81.........	100
do	40	....	1877, '81.........	120
do	42	W. ½........................	1881, '85, '00.....	50
do	46	....	1877, '81, '85.....	101
do	47	....	1877, '81, '85.....	101
do	48	....	1877, '81, '85.....	101
do	49	....	1877, '81, '85.....	101
do	55	....	1877, '81, '85.....	100
do	56	....	1877, '81.........	100
do	57	....	1877, '81.........	100
do	58	....	1877, '81.........	100
do	59	....	1877, '81.........	100
do	60	....	1877, '81.........	115
do	65	E. ½........................	1877, '81, '85.....	52
do	66	....	1877, '81, '85.....	103
do	67	....	1877.............	103
do	68	....	1877.............	103

FRANKLIN COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		MACOMB'S PURCHASE, GREAT TRACT 1, TOWNSHIP 15, SOUTH WEST ¼ (*Continued*)		
Brighton	75		1881, '85, '95	103
do	76		1877, '81, '85, '90	103
do	77		1877, '81, '85, '90	103
do	78		1877, '81, '85, '90	103
do	79		1877, '81, '85	103
do	80		1877, '81, '85	112
		Total, Township 15, 5,562 acres.		
		GREAT TRACT 1, TOWNSHIP 18,		
do	1		1877, '81, '85, '90	328
do	3		1877, '81, '85, '90	328
do	4		1877, '81, '85, '90	328
do	5		1877, '81, '85, '90	328
do	6		1877, '81, '85	356
do	11		1871, '77, '81, '85	328
do	13		1877, '81, '85, '90	328
do	14		1877, '81, '85, '90	328
do	16		1877, '81, '85	355
do	17	S. end	Conveyed in partition 1919 & 1877, '81, '85	217
do	18	S. end	Conveyed in partition 1919 & 1877, '81, '85	216
do	19	S. end	Conveyed in partition 1919 & 1877, '81, '85	213
do	20	S. end	Conveyed in partition 1919 & 1877, '81, '85	211
do	21		1877, '81, '85, '90	328
do	22		1877, '81, '85, '90	328
do	23		1877, '81, '85, '90	328
do	24		1877, '81, '85, '90	328
do	25		1877, '81, '85, '90	328
do	26		1877, '81, '85	354
do	27		Conveyed in partition 1919 & 1877, '81, '85	351.26

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		MACOMB'S PURCHASE, GREAT TRACT 1, TOWNSHIP 18 — (*Continued*)		
Brighton.....	28	....	Conveyed in partition 1919 & 1877, '81, '85....	350.10
do	29	....	Conveyed in partition 1919 & 1877, '81, '85....	348.20
do	30	....	Conveyed in partition 1919 & 1877, '81, '85....	346.35
do	31	....	1877, '81, '85, '90..	328
do	32	....	1877, '81, '85, '90..	328
do	33	....	1877, '81, '85, '90..	328
do	34	....	1877, '81, '85, '90..	328
do	35	....	1877, '81, '85, '90..	328
do	36	....	1877, '81, '85......	352
do	37	....	Purchase 1900....	352.67
do	38	....	Purchase 1900.....	350.85
do	39	....	Conveyed 1898 in partition & 1877, '81, '85, '00.....	350
do	41	....	1877, '81, '85......	328
do	42	....	1877, '81, '85, '90..	328
do	43	....	1877, '81, '85, '90..	328
do	44	....	1877, '81, '85, '90..	328
do	45	....	1877,'81,'85,'90,'05.	328
do	46	....	Conveyed 1898 in partition & 1877, '81, '85, '90.....	351
do	47	....	Purchase 1900 & 1877, '81, '85....	349.38
do	48	....	Purchase 1900 & 1877, '81, '85....	347.48
do	58	Ex. 277 $\frac{44}{100}$a. W. part 51c. wide E. & W. bd. E. by Ricketson's Purchase..................	Purchase 1899.....	50.56
do	67	....	1877, '81, '85, '90..	328
do	68	E. part of 277.44a W. part bd. E. by Ricketson's Purchase......	Purchase 1899.....	34.44
do	68	W. pt.......................	1877, '81, '85, '90..	243
do	76	S. W. cor. 27c. N. & S. & 35c. E. & W..................	1877.............	94

FRANKLIN COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		MACOMB'S PURCHASE, GREAT TRACT 1, TOWNSHIP 18 — (*Continued*)		
Brighton.....	77	S. W. cor. 21c. N. & S. & 36c. E. & W....................	1877, '81, '85, '90..	75
do	87	....	1877, '81, '85, '90..	328
do	98	Ex. 160a. N. pt...............	1877, '81, '85, '90..	168
		Ricketson Tract,		
do	59,60, 69,70, 79,80, 90	B'd beg. at N. E. cor. of lot 6 of said Tract, at an old cedar post the N. E. cor. of James Patterson's farm; th. N. on E. line of Township 221c, 13l. to N. E. cor. of S. E. ¼ of said Township th. N. 85° W. along N. line of said S. E. ¼ also N. line of the Ricketson Tract 75c. 90l to land of Rainbow Inn; th. S. 5° W. along same and land of H. M. T. Doty, 40c. 87l to Frank Wardner; th. S. 85° E. along Wardner's N. line 14c. 40l. to N. E. cor. of said Wardner's land; th. S. 5° W. along said Wardner's land 26c. 53l., to S. E. cor. of said Wardner's land; th. N. 85° W. along said Wardner's S. line 11c. 87l. to N. E. cor. of L. Chase's land; th. S. 5° W. along E. lines of Chase's Butts and McIntosh lands 33c. 43l. to S. E. cor. of said McIntosh's lands; th. N. 85° W. along McIntosh S. line 38c. 80l. to N., E. cor. of H. L. Wait's land; th. S. 5° W. along Wait's E. line 31c. to S. E. cor. of said Wait's land; th. N. 85° W. along said H. Wait's S. line 5c. 82l. to N. E. cor. of C. J. Riley land; th. S. 5° W. along Riley's E. line 21c. 15l. to said Riley's S. E. cor.; th. S. 85° E.		

FRANKLIN COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		MACOMB'S PURCHASE, GREAT TRACT 1, TOWNSHIP 18, RICKETSON TRACT—(*Continued*)		
Brighton.....	.....	along the old lot line 37c. 60l. to N. W. cor. of lot 18; th. S. 5° W. along S. line of lot 15c. 50l. to N. W. cor. of Mrs. Jane Russell's land; th. S. 85° E. along Russell's N. line 25c. 55l. to the N. E. cor. of said Russell's land; th. S. 5° W. along said Russell's E. line 17c. 60l. to N. W. cor. of the Ricketson farm; th. S. 85° E. along N. line of said farm 46c. 40l. to N. E. cor. of said farm; th. S. 5° W. along E. line of said farm 35c. 38l to N. W. cor. of James Patterson's land; th. S. 85° E. along said Patterson's N. line 15c. 62l. to beg....... Total Township 18, 15,995.08 acres.	Purchase 1908....	1,686.79
		GREAT TRACT 1, TOWNSHIP 20,		
Santa Clara..	1	....	Purchase 1898....	640
do ..	2	....	Purchase 1898....	640
do ..	3	18.50a. Bd. beg. on N. line 6c. W. from N. E. cor., th. S. 9c. 80l. th. W. 18c. 50l. th. N. 10c. 20l. to N. line of lot, th. E. to beg. and S. ½...............	Purchase 1898....	343.50
do ..	4	Ex. Railway; 57.51a. S. W. cor. bd. N. by R. R. land E. by a line par'l to and 56c. 50l. E. from W. line of lot and 8.4a. S. E. cor. bd. N. by R. R. land and W. by a line par'l to and 6c W. from E. line of lot.....	Purchase 1898....	562.28
do ..	5	....	Purchase 1898....	640
do ..	6	....	Purchase 1898....	790

FRANKLIN COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		MACOMB'S PURCHASE, GREAT TRACT 1, TOWNSHIP 20—(*Continued*)		
Santa Clara..	7	....	Purchase 1898....	790
do ..	8	....	Purchase 1898....	640
do ..	9	All N. of Railway..............	Purchase 1898....	318.11
do ..	11	Ex. Markham Point, Dry Island and Tommy's Rock..........	Purchase 1898....	581
do ..	12	Ex. 7.3a. Markham Point.......	Purchase 1898....	632.70
do ..	13	Ex. 91.4a. Moss Point..........	Purchase 1898....	548.60
do ..	14	Ex. 244.8a. W. p't bd. E. by Saranac Lake; Dry Island; Green Island; Markham Point and Moss Point............	Purchase 1898....	373
do ..	16	N. of Railway.................	Purchase 1898....	167.21
do ..	17	....	Purchase 1898....	640
do ..	18	....	Purchase 1898....	790
do ..	19	....	Purchase 1898....	790
do ..	20	....	Purchase 1898....	640
do ..	21	Ex. Railway..................	Purchase 1898....	625
do ..	22	....	Purchase 1898....	640
do ..	23	....	Purchase 1898....	640
do ..	24	....	Purchase 1898....	640
do ..	25	....	Purchase 1898....	640
do ..	26	....	Purchase 1898....	640
do ..	27	....	Purchase 1898....	640
do ..	28	Ex. Railway..................	Purchase 1898....	627.01
do ..	29	....	Purchase 1898....	640
do ..	30	....	Purchase 1898....	790
do ..	31	....	Purchase 1898....	790
do ..	32	....	Purchase 1898....	640
do ..	33	Ex. Railway..................	Purchase 1898....	625.71
do ..	34	Ex. Railway..................	Purchase 1898....	630.52
do ..	35	....	Purchase 1898....	640
do ..	36	....	Purchase 1898....	640
do ..	37	Ex. Pine or Camp Point on Rollins Pond...............	Purchase 1898....	591
do ..	38	Ex. Railway..................	Purchase 1898....	624.45
do ..	39	Ex. Railway..................	Purchase 1898....	633.03
do ..	40	....	Purchase 1898....	640
do ..	41	....	Purchase 1898....	640
do ..	42	....	Purchase 1898....	790
		Total, Township 20, 24,933.12 acres.		

FRANKLIN COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		MACOMB'S PURCHASE, GREAT TRACT 1 — (*Continued*)		
		TOWNSHIP 21,		
Harrietstown	.....	Beg. on E. line of Township 20, at a point 2c. S. of the S. shore of Little Clear Pond at high-water mark, th. N'ly on Township line 60c. & th. following the E. shore of said pond at a distance of 2c. from high-water mark S'ly to beg............	Conveyed 1885....	40
		S. E. ¼, (H. K. Averill, Jr. map)		
do	.....	Parcel b'd N. by center line of Twp. E. by Lot 87, S. by Lots 87 and 88 and W. by Lot 88..	1895.............	31
do	.....	Parcel b'd N. by center line of Twp. E. by Lot 88, S. by P. S. Carley and Frank Coolon and W. by P. S. Carley......	1895.............	146
do	.....	Parcel b'd N. by Lot 87, E. by W. line of 3095 acres E. end of S. E. ¼, S. by Lot 59 and W. by Lot 74..................	1895.............	73
do	.....	Parcel b'd N. by lot 21, E. by Lots 5 and 21, S. by Lot 6 and W. by lots 7 and 21, together with road to Lower Saranac Lake......................	1895.............	30
do	.....	Watch Island in McAuley Pond.	1895.............	1
do	.....	Peter W. Carley Lot, All S. & E. of R. R. ex. parcel N. of State road, and S. of road to Rice's, 1½a; and Westcott lot, 1 acre..	Purchase 1918....	194
do	.....	Henry Coolon lot.............	Purchase 1918....	50
do	8	....	Appropriated 1900.	151.90
do	9	....	Appropriated 1900.	136.80
do	10	....	Appropriated 1900.	121.70
do	11	....	Appropriated 1900.	105.50
do	12	....	Appropriated 1900.	91.60
do	13	....	Appropriated 1900.	78.20
do	14	....	Appropriated 1900.	90.20
do	18	....	Appropriated 1900 and 1895.......	171.60
do	19	....	Appropriated 1900.	147.60

FRANKLIN COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		MACOMB'S PURCHASE, GREAT TRACT 1, TOWNSHIP 21 — S. E. ¼, (*H. K. Averill, Jr., map*) — (*Continued*)		
Harrietstown.	20	N. of Forest Home Road.......	Appropriated 1900 & 1905.........	70.80
do	21	N. of Forest Home Road.......	Appropriated 1900.	46.80
do	22	....	Appropriated 1900.	160
do	23	....	Appropriated 1900.	160
do	24	....	Appropriated 1900.	200.30
do	25	....	Appropriated 1900.	213.50
do	26	....	Appropriated 1900.	223
do	27	....	Appropriated 1900.	160
do	28	....	Appropriated 1900.	229
do	33	....	Appropriated 1900.	166
do	34	....	Appropriated 1900.	160
do	35	....	Appropriated 1900.	155.30
do	36	....	Appropriated 1900.	160
do	37	....	Appropriated 1900.	172.30
do	41	....	Appropriated 1900.	130
do	42	....	Appropriated 1900.	217.80
do	45	....	Appropriated 1900 and 1895.......	134.60
do	46	Ex. 7a. R. R..................	Appropriated 1900.	156
do	47	....	Appropriated 1900.	160
do	48	....	Appropriated 1900.	160
do	49	....	Appropriated 1900.	159.10
do	50	....	Appropriated 1900.	170
do	55	....	Appropriated 1900.	114.10
do	56	....	Appropriated 1900.	207.40
do	59	....	Appropriated 1900 and 1895.......	203.70
do	60	....	Appropriated 1900.	148.60
do	61	....	Appropriated 1900.	134.90
do	62	....	Appropriated 1900.	141.90
do	63	....	Appropriated 1900.	84
do	66	....	Appropriated 1900.	79.10
do	67	....	Appropriated 1900.	85.40
do	68	....	Appropriated 1900.	81.90
	69	....	Appropriated 1900.	138.50
do	70	....	Appropriated 1900.	234.40
do	74	....	Appropriated 1900 and 1895.......	116

FRANKLIN COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		MACOMB'S PURCHASE, GREAT TRACT 1, TOWNSHIP 21, S. E. ¼, (*H. K. Averill, Jr., map*) — (*Continued*)		
		....		
Harrietstown.	80	....	Appropriated 1900.	202
do	81	....	Appropriated 1900.	209
do	82	Ex. the part N. of Mill Pond.	Appropriated 1900.	209.50
do	83	....	Appropriated 1900.	181.70
do	87	....	Appropriated 1900 and 1895.......	17
do	88	....	Appropriated 1900.	98.40
do	93	....	Appropriated 1900 and 1895.......	248.30
do	105	....	Appropriated 1900.	248
do	106	Total, Township 21, 8,526.60, acres.	Appropriated 1900.	118.20
		GREAT TRACT 1, TOWNSHIP 23, NORTH ½,		
Santa Clara..	...	E. end........................	1877, '81, '85......	4,379
do ..	...	W. end........................	Purchase 1898.....	6,661
		SOUTH EAST ¼,		
Harrietstown.	...	E. end of 1,240a. S. end........	Purchase 1898.....	300
do	...	N. end 6,280a. ex. 144a. N. W. cor. thereof 80c. N. & S. by 18c. E. & W.; Birch Island; 267a. bd. beg. at a stake and stones, N. 2° W. 24r. from a large rock on N'ly bank of the outlet and 2r. and 10 ft. below the State Dam, called Norton's Dam, th. N. 80° E. 150r. to a stake and stones, 10r. N. of the N. bank of said outlet, th. S. 10° E. 214r. to a stake and stones on a high hill, th. S. 80° W. 200r. to a stake and stones, th. N. 10° W. 214r. and th. N. 80° E. 50r. to beg.; 266 $\frac{17}{20}$ a. b'd		

FRANKLIN COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		MACOMB'S PURCHASE, GREAT TRACT 1, TOWNSHIP 23, S. E. ¼, — (*Continued*)		
Harrietstown.		beg at a large rock on the S'ly shore of the Lake, near the Indian Carry, nearly N. from "Rustic House" and S. from Birch Island, th. N. 34r., th. E. 114r., th. S. 230r., th. W. 194r., th. N. 200r. and th. E. 80r. to beg. and ex. 27 parcels reserved in deed by S. M. Weed and M. V. B. Turner and wife to State in 1901.....	Conveyed 1901 & 1877,'81,'00,'05..	3,862
		SOUTH WEST ¼		
do	...	All ex. 100a. N. E. cor. 25c. N. and S. and 40c. E. and W.....	Purchase 1898.....	7,420
		Total, Township 23, 22,622 acres.		
		GREAT TRACT 1 TOWNSHIP 24, NORTH EAST ¼,		
do	...	W. ½ ex. 1,662a. water..........	1877, '81, '85......	2,088
do	...	E. ½; parcel, beg. at hewn post 124 ft. S. from edge of timber or Bluff line and on a line marking the E. boundary of the lands of the State, and running along said line, N. 4° 45′ E. 1,050 ft. to another post; th. deflecting 90° and running S. 85° 15′ E. 2,455 ft. to a hewn post; th. deflecting 90° and running S. 4′ 45′ W. 1,050 ft. to a hewn post; th. deflecting 90° and running N. 85° 15′ W. 2,455 ft. to the point of beg........	Appropriated 1898.	59.18
		NORTH WEST ¼		
do ..	...	All ex. 1,000a. Lower Saranac Lake......................	1877, '81, '85, '95..	6,500

FRANKLIN COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		MACOMB'S PURCHASE, GREAT TRACT 1, TOWNSHIP 24 — (*Cont'd*) SOUTH EAST ¼		
Harrietstown.	...	All	1877, '95, '00	7,500
		SOUTH WEST		
do	...	All	1877, '81, '85	7,500
		Total Township 24, 23,647.18 acres.		
		GREAT TRACT 1, TOWNSHIP 26,		
do	...	All E. of Raquette River b'd. S. by a line parallel to N. line of Township and far enough distant therefrom to contain 15,619a. ex. therefrom that part of 1,333 $\frac{44}{100}$a., the Raquette Falls lot, lying E. of the Raquette River, and ex. ½a. being the School house lot	Purchase 1898	14,951.78
		TOWNSHIP 27, NORTH WEST ¼, North Part — 1,961a, Tract, (West End — 1,561a.)		
do	1		1881	390.25
do	2	W. end	Conveyed 1903	100
do	3	W. ½	1881	195.12
do	4		Conveyed 1903	386
		NORTH EAST ¼		
do	.....	All	Purchase 1909	7,633
		Total Township 27, 8,704.37 acres.		
		GREAT TRACT 2, TOWNSHIP 3,		
Altamont	1		Purchase 1918	624
do	14		Purchase 1918	547
		Total Twp. 3, 1,171a.		

FRANKLIN COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		OLD MILITARY TRACT, TOWNSHIP 8,		
Bellmont	29	Henry Marshall Lot	1915	17
do	36	N. W. cor. square	1877, '81, '85	200
do	55		1877, '81, '85	640
do	63	N. W. ¼	1871, '77, '81, '85	160
do	63	S. ½	1895, '00	320
		Total, Township 8, 1,337 acres.		
		OLD MILITARY TRACT, TOWNSHIP 9,		
Franklin	2		1885, '90	136
do	7	N. W. ¼	1877, '81, '90	36.87
do	31		1900,'05	171
Bellmont	45		1871, '77' '81	160
do	81	Ex. N. E. ¼	1877, '90	120
Franklin	138	S. W. ¼	1877, '81, '85	50
Bellmont	273		1881, '85	160
Franklin	294		Original & 1900*	180
do	296		1905, '10	160
Bellmont	300		1877, '81, '85, '90	160
do	308	E. ½ ex. 13a. W. part	1877, '81, '85, '90	67
do	309		1881, '85, '90, '95	160
do	310		1877, '81, '85, '90	160
Franklin	317		Original & 1900*	160
do	330		Original & 1900*	160
do	332		Original & 1900*	160
do	333		Original & 1900*	160
Bellmont	338	S. E. ¼	1877, '81, '85	40
do	341	E. ½	1881, '85	80
do	343		1881, '85	107
Franklin	352		1871, '77, '81	182.80
do	353		Original & resale 1867	180
do	354		1881, '85	220.60
do	359		1877, '81, '85, '90	161.40
		Total, Township 9, 3,332.67 acres.		

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* Resale, 1899.

FRANKLIN COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		OLD MILITARY TRACT—(*Cont'd*) TOWNSHIP 10,		
Franklin	5		Purchase 1906	200
do	14		Purchase 1907	200
do	15		1877, '81, '85, '90	200
do	16		1877, '81, '85, '90, '95	200
do	17		1877, '81, '85, '90, '95	200
do	18		1877, '81, '85, '90	200
do	19	S. ⅔ of W. 120a	1877, '81, '85, '90	80
do	24	S. ½	Purchase 1905	100
do	25		Purchase 1907	200
do	30	E. pt	Purchase 1906	145
do	31		1900, '05	200
do	33		1877, '81, '85, '90	200
do	34		1877, '81, '85, '95	200
do	38		1877, '81, '85, '90	200
do	57		1890	200
do	60	N. ½ & S. W. ¼	Purchase 1905	150
do	61		Purchase 1905	232
do	76		1895, '00	232
do	77		1890, '95	232
do	80	N. part	Purchase 1905	60
do	81	N. W. cor	1895, '00	23
do	83	All W. of highway	1881, '85	107
do	84	S. W. cor	1877, '81	15
do	85		1877, '81, '85	168
do	87		1877, '81, '85, '90	168
do	88		1881, '85, '90	168
do	89		1877, '81, '85, '90	168
do	90		1877, '81, '85, '90	168
do	96		1877, '81, '85, '90	168
do	97		1895, '00	168
do	99		Purchase 1905	168
do	100	Ex. 33a. W. pt	Purchase 1905	135
do	101	S. ½	Purchase 1905	100
do	102		Purchase 1905	200
do	103		Purchase 1905	200
do	104		Purchase 1905	200
do	105		1900, '05	200
do	106		1877, '81, '85, '95	200

FRANKLIN COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		OLD MILITARY TRACT, TOWNSHIP 10 — (*Continued*)		
Franklin.....	107	....	1877, '81, '85, '95..	200
do	108	....	Purchase 1905.....	200
do	109	....	Purchase 1906.....	200
do	112	....	1877, '81, '85, '90..	200
do	113	....	1877, '81, '85, '90..	200
do	114	....	1871, '77, '81, '85, '90.............	200
do	115	....	1871, '77, '81, '85..	200
do	116	....	1881, '85.........	200
do	126	....	1871, '77, '81, '85, '90.............	200
do	127	....	1871, '77, '81......	200
do	128	....	1871, '77, '81......	200
do	130	....	Pur. 1905 & 1905..	200
do	131	....	Purchase 1906.....	200
do	137	....	1900, '05.........	200
do	138	....	1877, '81, '85......	200
do	140	....	Purchase 1905.....	200
do	141	....	1871, '77, '81, '85..	200
do	144	Ex. N. ½ of W. 120a...........	1871, '77, '81, '85..	160
do	150	....	Original*.........	200
do	151	E. ½........................	Purchase 1906.....	100
do	152	....	1877, '85.........	200
do	153	....	1881, '85.........	200
do	154	....	1885, '90.........	200
do	160	....	1890, '95.........	200
do	166	Ex. 40a. N. ½ of W. 120a.......	Pur. 1905 & 1877, '81, '85.........	160
do	167	....	1877, '81, '85......	200
do	168	....	1877, '81, '85......	200
do	171	....	1871, '77, '81, '85, '90.............	200
do	172	....	*Original & conveyed 1913.....	200
do	179	....	1871, '77, '81, '85, '95............	200
do	180	N. ½ and S. E. ¼..............	1900, '05.........	150
do	188	....	1877, '81, '85.....	200
do	189	....	Purchase 1905....	200
do	190	....	1877, '81, '85, '95..	200

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* Resale, 1899.

FRANKLIN COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		OLD MILITARY TRACT, TOWNSHIP 10 — (*Continued*)		
Franklin	191		1881, ’85	200
do	193		1871, ’77, ’81, ’95	200
do	195	S. ½ of E. 80a	1881, ’85	40
do	198	N. ½ and S. W. ¼	1871, ’77, ’81	150
do	199	W. ½	1877, ’81, ’85, ’90	100
do	200		1877, ’81, ’85, ’90	200
do	201		1890	200
do	209		1877, ’81, ’85	200
do	210		1877, ’81, ’85, ’90	200
do	211		1871, ’77, ’81, ’85, ’95	200
do	212		1881, ’85	200
do	213		Purchase 1905	200
do	214		Purchase 1905	200
do	215		Purchase 1905	200
do	216		Purchase 1905	200
do	225		1871, ’77, ’81, ’85, ’95	200
do	226		1871, ’77, ’81, ’85, ’95	200
do	227		Purchase 1905	200
do	228	E. ½	Purchase 1905	100
do	229		1871, ’77, ’81, ’85, ’90	200
do	230		1871, ’77, ’81, ’85, ’95	200
do	231		1871, ’77, ’81, ’85	200
do	232		1877, ’81	200
do	233		1877, ’81	200
do	235	S. E. cor	1900	2
do	242	N. pt. of S. W. ¼	1895, ’00	20
do	242	N. pt. of S. W. ¼	1895, ’00	20
do	243	N. ½ ex. 1a, Starch Mill lot	Mortgage	99
do	250		1877, ’81, ’85, ’90	200
do	251		1871, ’77, ’81, ’85	200
do	254		Purchase 1905	200
do	255		Purchase 1905	200
do	256		1877, ’81, ’85, ’95	200
do	270		1877, ’81, ’85, ’90	200
do	271		1877, ’81, ’85, ’90, ’95	200

FRANKLIN COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		OLD MILITARY TRACT, TOWNSHIP 10 — (*Continued*)		
Franklin	272	Ex. 25a. S. E. cor. (Page)	1890, '95	175
do	274		1890, '95, '00	200
do	278		Purchase 1909 & 1877, '81, '95, '15.	200
do	279		Pur. 1907 & 1910	200
do	280		1877, '81, '95	200
do	281		1877, '81	200
do	285	N. W. ¼	1881, '85	50
do	287		1877, '81, '85	200
do	288	S. ½ & N. E. ¼	1877, '81, '85, '90	150
do	289		1877, '81, '85, '90, '95	200
do	290		1871, '77, '81, '85	200
do	293		1885, '90	200
do	294		1871, '77, '81, '85	200
do	312		1871, '77, '81, '85	200
do	313		1871, '77, '81, '85	200
do	314		1877, '81, '85, '90	200
do	315	E. pt	1885, '90	80
do	316	Ex. 50a. S. W. cor	1871, '77, '85	150
do	317		Pur. 1908 & 1871, '77, '81, '85, '10.	200
do	318		1871, '77, '81, '85	200
do	319	S. ½	1871, '77, '85	100
do	321	S. pt. 13c. on E. line & 24c. on W. line, b'd N. by high-way, 92½a. ex. Railway and ½a. adjacent to same	Purchase 1908	87.91
do	323	N. ½	1881, '85	100
do	324	N. ½ and S. W. ¼	1871, '77, '81, '85	150
do	327		1877, '81, '85, '95	200
do	328		1887, '81, '85, '90	200
do	329		1877, '81, '85, '90	200
do	330		1877, '85, '90	200
do	333		1877	200
do	334		1877, '95	200
do	335	N. ½ & S. W. ¼	1871, '85, '95	150
do	352		1877, '81, '85, '90	240
do	353		1871, '77, '81, '85, '95	240
do	355		1877, '81, '85, '90	240

FRANKLIN COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		OLD MILITARY TRACT, TOWNSHIP 10 — (*Continued*)		
Franklin.....	356	....	1877, '81, '85, '90..	240
do	357	....	1877, '81, '85.....	240
do	358	....	1877, '81, '85, '90..	240
do	359	Ex. 50a. W. end, (LaBounty)...	1871, '77, '85.....	190
do	360	....	1871, '77, '81, '85..	240
		Total, Township 10, 26,098.91 acres.		
		ST. REGIS RESERVATION, FARM LOTS,		
Bombay.....	6	N. E. cor.....................	Original and resale, 1867...........	.21
		WATERS		
Bombay.....	...	St. Lawrence River. All in Franklin Co................	Original..........	1,000
Harrietstown.	...	Lower Saranac Lake. All in Twp. 21....................	1895.............	251
do .	...	Lower Saranac Lake,. All in Twp. 24....................	1877, '81, '85.....	2,662
do .	...	McAuley Pond................	1895.............	70
		Total, Waters, 3,983.00 acres		

FULTON COUNTY

(*Total number of acres*, 32,446.12.)

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		CHASE'S PATENT		
Bleecker.....	8	....	1871, '77, '85.....	100
do	35	....	1877, '81, '85.....	100
do	46	E. pt. b'd W. by C. Shafer......	1895, '00.........	48
do	52	E. ½.......................	1881, '85.........	50
do	60	....	1877, '81, '85.....	100
do	61	....	1871, '77, '81, '85..	100
Mayfield.....	92	All in Mayfield................	1877, '81, '85.....	30
Bleecker.....	103	All in Bleecker................	1881, '85.........	17.50
Mayfield.....	110	N. W. cor. 30a. & S. W. cor. 15a	1877, '81, '85.....	45
do	114	....	1877, '81, '85.....	100
		Total, Chase's Patent, 690.50 acres.		
		GLEN, BLEECKER AND LANSING PATENT,		
Mayfield.....	2	Sub. 1......................	1877, '81.........	125
do	2	Sub. 2......................	1877, '81, '85.....	125
do	3	Sub. 1......................	1877, '81, '85.....	100
do	4	Sub. 2......................	1881.............	99
do	4	Sub. 3......................	1877, '81.........	99
do	4	Sub. 4......................	1877, '81, '85.....	80
do	4	Sub. 5......................	1877, '81, '85.....	119
do	4	Sub. 6......................	1877, '81, '85.....	99
do	4	Sub. 7......................	1877, '81, '85.....	99
do	6	Sub. 5, S. ½ in Mayfield........	1877, '81.........	50
do	6	Sub. 7......................	1877, '81, '85.....	100
do	6	Sub. 10.....................	1877, '81, '85.....	100
do	9	Sub. 5......................	1877, '81, '85.....	82.50
do	9	Sub. 6......................	1877, '81, '85.....	82.50
do	9	Sub. 7......................	1877, '81, '85.....	94
do	11	Sub. 3......................	1881, '85.........	105
do	11	Sub. 4......................	1881, '85.........	105
do	11	Sub. 5......................	1885, '90.........	105
do	11	Sub. 6......................	1885, '90.........	105
do	11	Sub. 7......................	1881, '85, '95.....	105
do	11	Sub. 11.	1881, '85, '95.....	105
Bleecker.....	11	Sub. 12.....................	1881, '85, '95.....	105
do	14	Sub. 5, S. E. corner b'd W. by Ira Hall and W. H. Porter ...	1900.............	27
do	14	Sub. 6......................	1877, '81, '85.....	100
do	15	Sub. 1......................	1881, '85.........	125

FULTON COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		GLEN, BLEECKER & LANSING PATENT — (*Continued*)		
Mayfield	16	Sub. 1	1881, '85	100
Bleecker	16	Sub. 2 All in Bleecker	1885, '90	51
do	16	Sub. 6 All in Bleecker	1885, '90	49.50
Mayfield	16	Sub. 7 E. ½ in Mayfield	1885	50
do	16	Sub. 8	1877, '81, '85, '90	100
do	17	Sub. 2	1895, '00	122.50
do	17	Sub. 3	1871, '77, '81, '85	125
do	17	Sub. 4	1895, '00	125
do	17	Sub. 5	1877, '81, '85	125
do	17	Sub. 6	1877, '81, '85	125
do	17	Sub. 7 All in Mayfield	1895, '00	122.50
Bleecker	18	Ex. 200a. N. side	1877, '85	550
do	21	Sub. 3, ex. 50a. N. pt	1877, '81	53
do	22	Sub. 1	1877, '81	50
do	33	E. pt	1881, '85	100
do	35	Sub. 4	1895, '00	100
do	38		Pur. 1918 & 1890, '95	1,005.58
do	39	Ex. dam site 2.66a	Purchase 1918	1,198.85
do	41	Sub. 7	1877, '81	100
do	41	Sub. 8	1877, '81, '90	100
do	43	Sub. 3, ex. 74¼a. E. pt	1881, '85	24.75
do	43	Sub. 4, ex. 109¾a. E. pt	1881, '85	36.25
do	43	Sub. 8, ex. 74¼a. E. pt	1881, '85	24.75
Caroga	47	N. ¾	Purchase 1918	720.80
do	48		Purchase 1918	1,383.94
do	49		Conveyed 1919 & 1890, '95	1,000
do	51	Sub. 1	1871, '77	127.50
do	51	Sub. 2	1871, '77	127.50
do	51	Sub. 3	1877, '95	127.50
do	51	Sub. 4	Purchase 1919	127.50
do	51	Sub. 5	1871, '77	132.50
do	51	Sub. 7	1871, '77	132.50
do	51	Sub. 8	1871, '77	132.50
do	52	Sub. 1	Purchase 1919	101.34
do	52	Sub. 2	Conveyed 1919 & 1877	101.34
do	52	Sub. 4	Purchase 1919	101.34
do	52	Sub. 5	Purchase 1919	101.34

FULTON COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		GLEN, BLEECKER & LANSING PATENT — *(Continued)*		
Caroga	52	Sub. 6	Conveyed 1919 & 1877, '81, '85	101.34
do	52	Sub. 7 Ex. cottage sites W. end of lot	Purchase 1919	106.41
do	52	Sub. 8	Purchase 1919	106.41
do	52	Sub. 9	Purchase 1919	106.41
do	52	Sub. 10	Purchase 1919	106.41
do	53	Sub. 7	1877, '81, '85	100
do	53	Sub. 8, E. part	Purchase 1918	60
do	53	Sub. 9	Purchase	100
do	53	Sub. 10	1877, '81, '85	100
do	58	Sub. 2	Purchase 1918	104
do	58	Sub. 8	1877	112
do	59	S. part b'd N'ly by cottage site allotment and highway	Purchase 1918	681
do	60	S. E. corner b'd N. by Green Lake and N. part ex. dam site lot of 74.10 acres	Purchase 1918	582.70
do	61	Ex. Sub. 4; cottage sites on Pine Lake 11.69a. and Pine Lake clearing 135.35a.	Purchase 1919	787.15
do	61	Sub. 4	1877	100
do	62	Sub. 1	Conveyed & 1877	130
do	62	Sub. 2	Conveyed & 1877	130
do	62	Sub. 3	Conveyed & 1877	130
do	62	Sub. 4	Conveyed & 1895, '00	130
do	62	Sub. 5	Conveyed & 1895, '00	130
do	62	Sub. 6	Conveyed & 1871, '77	130
do	62	Sub. 7	Conveyed & 1877	130
do	62	Sub. 8	Conveyed & 1877	130
do	62	Sub. 9	Conveyed & 1877	130
do	62	Sub. 10	Conveyed & 1877	130
do	63		Purchase 1918 & 1871, '77, '81	1,070.08
do	64	Ex. dam site 1.90a.	Purchase 1918	1,153.12
do	65	Ex. waters of East and West Canada Lakes; the cottage sites N. of West Canada Lake,		

FULTON COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		GLEN, BLEECKER & LANSING PATENT — (*Continued*)		
Caroga......	65	12.90a; the land between East and West Canada Lakes, 2.79a. Mud Lake and cottage sites in S. E. corner of lot...........	Purchase 1918....	945.76
do	66	Ex. East and West Canada Lakes, Lily Lake and outlet thereof, land between East and West Canada Lakes, 17.67a., cottage sites S. E. of East Canada Lake, 5.68a., Tyoe lot S. W. of East Canada Lake, 79a. and dam site lot 6a......	Purchase 1918.....	987.93
do	68	Sub. 10......................	1877, '81..........	100
Stratford....	70	Sub. 3........................	1890, '95, '00......	99
do	70	Sub. 4........................	1885, '90, '95.....	80.35
do	71	Sub. 1........................	1877, '81, '85......	101.50
do	71	Sub. 4........................	1877, '81, '85......	101.50
do	71	Sub. 5........................	1877, '81, '85......	101.50
do	71	Sub. 8........................	1895, '00..........	101.50
do	71	Sub. 9........................	1895, '00..........	137
do	71	Sub. 10......................	1895, '00..........	161.20
do	72	Sub. 1........................	1890, '95..........	118
do	72	Sub. 4........................	1890, '95..........	118
do	72	Sub. 8, W. end 25c. 75l. E. & W.	1895, '00..........	49.64
do	78	S. E. cor. 50c. N. & S. 20c. E. & W........................	1895, '00..........	100
do	82	Sub. 7........................	1881, '85..........	133.62
do	82	Subs. 8 and 9..............	1890..............	89.00
do	82	Sub. 10......................	1890..............	18
do	82	Sub. 11......................	1890, '95..........	76.11
do	83	Sub. 3, S. pt. of N. ½...........	1871..............	30
do	83	Sub. 4........................	1877, '81, '85, '00..	105
do	83	Sub. 5........................	1877, '81, '85.....	96.12
do	83	Sub. 6, ex. 90a, N. pt..........	1871, 1890........	110
do	83	Sub. 6. Jacob Arnst lot.........	1900..............	2
do	84	Sub. 2........................	1881, '90..........	100
do	84	Sub. 3, S. ½..................	1885, '90..........	51
do	84	Sub. 4........................	1877, '81, '85.....	98
do	84	Sub. 5........................	1877, '81, '85.....	98
do	84	Sub. 9........................	1895, '00..........	100
do	84	Sub. 10 ex. 85½a. W. part.......	1895, 1900........	16.50

FULTON COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		GLEN, BLEECKER & LANSING PATENT — (*Continued*)		
Stratford	85	Sub. 2. W. ½	1890, '95, '00	50
do	85	Sub. 3	1895, 1900	100
do	85	Sub. 4	1877, '81	100
do	85	Sub. 9	1877, '81, '85, '90	100
do	90	Sub. 1 N. pt. of 32a., W. pt.	1871	4
		Total, Glen, Bleecker & Lansing Patent, 22,835.54 acres.		
		JERSEYFIELD PATENT,		
do	32	E. ½, Sub. 2, N. W. cor. John Wheeler Lot. W. of road	1895	12.50
do	32	Sub. 3, W. ½	1877	105
do	32	E. ½, Sub. 4	1895, '00	105.50
do	32	Sub. 5	1877, '81, '00	159
do	33	N. E. cor	1877	105
do	34	All in Stratford	1877	358.68
do	59	Sub. 6	1877, '81, '90	88.74
do	59	W. ½ All in Fulton Co	1900	60
do	60	N. E. cor. square	1871	20
do	60	Bd. N. by highway, E. by Gt. lot 66, S. by E. Canada Creek, W. by lands of G. P. Goodwin, 80a. ex. 45a. sq. S. E. cor	1900	38.70
do	64	Sub. 1, Peck lot	1900	106.20
do	64	Sub. 2	1877, '81	106.20
do	64	Sub. 3	1877, '81	106.20
do	64	Sub. 4	1900	106
do	64	Sub. 5	1900	106
do	66	W. ½	1877, '81, '85	525
do	66	S. E. ¼	1895, '00	262.50
do	67	All in Fulton Co., 934a., ex. 40a. N. E. cor. thereof	1877, '81, '85	894
do	68	All in Stratford	1900, '05	135
do	88	All in Stratford, 365a., ex. 100a., N. E. cor. thereof	1871, '77, '81	265
do	90	N. W. ¼	1871, '77, '81	262
do	91		1871, '77, '81	1,000
do	92		1885	1,000
do	93		1885, '90	1,080
do	95	"West" Old Porter Place	1900, 1905	.50

FULTON COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		JERSEYFIELD PATENT — (*Continued*)		
Stratford....	95	Bd. N. by lot 62, E. by lands of A. A. Bullock & Wm. Doxtater, S. by John Keller or Nora or Norah Bracey or J. Keck, & W. by Parmeliah Newell & Martin Bracey or Nora Brocey & Jason Hall........................	1890, '95.........	125
		Total, Jerseyfield Patent, 7,136.70 acres.		
		KINGSBORO PATENT, W'LY ALLOTMENT,		
Johnstown...	516	N'ly pt. J. Wiley lot...........	Mortgage, 1830...	25
		LOTT & LOW'S PATENT		
Ephratah....	7	Sub. 2 all in Ephratah of all ex. 100a. E. end of sub. & 30a. W. end of sub..................	1895.............	68.47
Caroga......	11	Sub. 2, ex. 25a. N. part of 45⅝a. S. part of sub.................	1877, '81, '85, '90..	108
do	11	Sub. 3, ex. 25a. N. part of 45⅝a. S. part of sub.................	1881, '85, '90, '95, '00.............	108
Stratford....	11	Sub. 4, all in Stratford.........	1890, '00.........	33
Caroga......	16	Sub. 1, all in Caroga...........	1900, '05.........	25
Stratford....	16	Sub. 1 N. W. ¼ of E. ½.........	1915.............	12.50
do	16	Sub. 1, N. E. ¼ of W. ½........	1905.............	12.50
do	16	Sub. 1, W. ¼..................	1915.............	25.40
do	16	Sub. 1, S. part across, b'd N. by Crowner, 44.13 acres ex. S. W. ¼ of sub................	1900, 1905........	15.00
do	16	Sub. 4, E. ½ ex. 37a. N. pt.....	1910, '15.........	15.00
do	16	Sub. 5, W. ½..................	1900, '05.........	75.00
do	17	Sub. 1.......................	1890, '95, '00.....	101.50
do	17	Sub. 2, ex. S. W. ¼............	1900, '05, '10, '15..	75
do	17	Sub. 3, S. E. ¼ Dempster.......	1910.............	25
do	17	Sub. 3, N. ½ of E. ½ Johnson.....	1900, '05.........	25
do	17	Sub. 3, E. ½ of W. ½ Mosher.....	1900, '05.........	25
do	17	Sub. 5, S. end, Miles...........	1900, '05.........	62
do	22	Sub. 2, E. end................	1890, '95, '05.....	20
do	37	O. Holcomb lot...............	1900, '05.........	1.50

FULTON COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		LOTT & LOW'S PATENT — (*Continued*).		
Stratford....	37	B'd N. by highway from Emmonsburg and Stratford road to Geo. Helterline's, E. by Leavitt's mill lot, S. by Moose Creek, W. by highway........	1900.............	.13
do	37	B'd N. & W. by highway, E. & S. by E. W. Leavitt.........	1900, 1905.......	.06
Stratford....	37	Carryl, Caral or Carl, L. lot b'd. beg. at N. W. cor. of Gertrude Hoxie, at a point 29l. E. of E. end of the bridge over Moose Creek.....................	1905, '10.........	3.30
		Total, Lott & Low's Patent, 922.86 acres.		
		MAGIN'S PATENT		
Ephratah....	24	Sub. 4......................	1895, '00.........	100
Oppenheim...	39	Sub. 1, beg. at land of Douglas Robinson th. S. 32° W. 26c. 25l. to a boundary stake, th. N. 58° W. 20c. to a hemlock marked 1 & 2, th. N. 32° E. 26c. 25l. to a boundary stake, and th. to beg.........	Mortgage.........	52.50
do ...	39	Sub. 2, bd. N. by lands formerly of Philip Armstrong or Jas. Graham & S. by lands formerly of Isaac Connell, being in the S. ½ of sub.................	Mortgage.........	27.50
do ...	42	N. E'ly cor., 31c. long N'ly and S'ly and 33c. 90l. wide E'ly and W'ly.....................	Mortgage 1803*...	105
		Total, Magin's Patent, 285 acres.		
		MAYFIELD PATENT,		
Bleecker.....	55	W. pt. in Bleecker............	1881.............	38
do	66	All in Bleecker................	1881, '85.........	11.50
do	67	All in Bleeeker	1881, '85.........	42
do	91	Bd. N. by 68 $\frac{4}{10}$a. in N. E. cor. of lot, E. and W. by lot lines S. by Sprung....................	1895, '00.........	30

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* Resale, 1899.

FULTON COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		MAYFIELD PATENT — (*Continued*)		
Caroga......	97	Bd. N. E. by Sprung, S. by Peck, W. by Stewart..............	1895, '00.........	25
do	97	Bd. N'ly by land formerly of N. Storms, E. by A. Nuger, S. W. by M. Ruff & W. by highway..	1900.............	15
do	98	S. pt..........................	1895, '00.........	165
do	100	N. E. cor......................	1885.............	25
do	102	S. E. ¼........................	1881.............	50
do	103	N. pt..........................	1881, '85.........	60
do	107 & 108	Geo. Wright b'd N. by Edward Bradt, E. by Michael Doran, S. by highway & W. by Wm. B. Caldwell..................	1890.............	20
		Total, Mayfield Patent, 481.50 acres.		
		MAYFIELD VILLAGE,		
Mayfield.....	....	Broadalbin Electric Power & Co., Chas. H. Harris, bd. N. by the highway, E. by lands of Buchanan & Warner, S. by Mrs. Barney Pinkney, or Barney Pinkney, and W. by N. O. Barney & Wm. Peck...	1910.............	10
		SACANDAGA PATENT,		
Broadalbin...	3	Parcel b'd beg. at a stake and stones near the foot of Haines Creek Hill, where the road runs up said hill, th. S. 61 deg. 30 min. W. 16c. 15l. to a stake in the line of lot No. 4, th. along said line N. 31 deg. 30 min. W. 46c. to a stake and stones, th. N. 61 deg. 30 min. E.8c.8l. to a stake and stones, th. S. 31 deg. 30 min. E. 14c. 10l. to a stake and stones, th. N. 61 deg. 30 min. E. 8c. 7l. to a stake and stones, th. S. 31 deg. 30 min. E. 31c. 30l to beg...........	State Mtg. (1833) and resale 1899..	63

HAMILTON COUNTY

(*Total number of acres,* 633,337.63.)

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		ARTHURBORO PATENT, NORTH ½,		
Morehouse...	1	....	Purchase 1899.....	36.55
do ...	2	....	Purchase 1897.....	46.11
do ...	3	....	1895, '00..........	52.71
do ...	4	....	1895, '00..........	62.94
do ...	5	....	1895, '00..........	63.40
do ...	7	....	Purchase 1898.....	20.00
do ...	8	....	Purchase 1898.....	82.35
do ...	13	....	Purchase 1898.....	200
do ...	15	....	Purchase 1898.....	200
do ...	16	....	Purchase 1898.....	200
do ...	17	....	Purchase 1898.....	200
do ...	19	....	Purchase 1898....	200
do ...	21	....	Purchase 1898.....	72.12
do ...	22	....	Purchase 1898.....	84.20
do ...	23	....	Purchase 1898.....	200
do ...	24	....	Purchase 1898.....	200
do ...	25	....	Purchase 1898.....	200
do ...	26	....	Purchase 1898.....	200
do ...	27	....	1877, '81 and Conveyed 1898.....	200
do ...	28	....	1877, '81, '85 and Conveyed 1898..	200
do ...	29	....	Purchase 1898....	200
do ...	30	....	Purchase 1898....	200
do ...	31	....	Purchase 1898.....	200
do ...	32	....	Purchase 1898....	200
do ...	33	....	1877, '81, '85......	200
do ...	34	....	Purchase 1898.....	200
do ...	35	....	Purchase 1898.....	94.25
do ...	36	....	1877, '81, '85......	97.22
do ...	37	....	Purchase 1898.....	200
do ...	38	Ex. 30a. S. W. pt..............	1881.............	170
do ...	39	....	Purchase 1898.....	200
do ...	41	....	1877, '81, '85 and Conveyed 1898..	200
do ...	42	....	Purchase 1898.....	200
do ...	46	....	Purchase 1898.....	200
do ...	47	....	1877, '81, '85......	200
do ...	48	....	1877, '81, '85......	200
do ...	49	....	1877, '81, '85......	120.17

HAMILTON COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		ARTHURBORO PATENT, NORTH ½ — (*Continued*)		
Morehouse...	50		1877, '81, '85......	126.30
do ...	51		1877, '81, '85......	200
do ...	59		Purchase 1898.....	200
do ...	62		1877, '81, '85......	200
do ...	63		1877, '81, '85......	130
do ...	64		Pur. 1901 & 1900, '05............	142.13
do ...	65		1877, '81, '85, '90..	200
do ...	66		1877, '81, '85 and Purchase 1898...	200
do ...	75		Purchase 1898.....	200
do ...	76		1877, '81, '85......	200
do ...	77		Pur. 1901 & 1900, '05............	145.33
do ...	78		Pur. 1901 & 1900, '05............	159
do ...	79		1877, '81, '85......	200
do ...	80		Purchase 1898.....	200
do ...	81		Purchase 1898.....	200
do ...	83		1877, '81, '85......	200
do ...	85		Pur. 1901 & 1900, '05............	200
do ...	86		Pur. 1901 & 1900, '05............	200
do ...	89		1877, '81, '85 and conveyed 1898...	200
do ...	90		1877, '81, '85 and conveyed 1898...	200
do ...	91		Pur. 1901 & 1900, '05............	187.48
do ...	92		1877, '81, '85 & conveyed 1898...	180.80
do ...	95		1877, '81, '85 & conveyed 1898...	200
do ...	96		Pur. 1901 & 1900, '05............	200
do ...	97		1843, '85, '90*....	200
do ...	98		Conveyed 1898....	200
do ...	100		Conveyed 1898....	231
do ...	101		Conveyed 1898....	231
		Total, N. ½, 11,135.06 acres.		

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* Resale 1861.

HAMILTON COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		ARTHURBORO PATENT — (*Cont'd*) SOUTH HALF, BETHUNE TRACT,		
Morehouse...	1	North part..................	Pur. 1907 & '85, '90	134
do ...	3	N. pt., 100a., & N. W. cor. of rem. 25 acres....................	1843,* 1885.......	125
do ...	5	....	1843*............	120
do ...	6	....	1843*............	120
do ...	7	....	1843* and purchase	
do ...	...	....	1898...........	300
do ...	8	....	1843,* '77, '81, '85, '90............	300
do ...	9	W. side, N. W. of Creek........	1843*............	60
do ...	9	S. E. cor. S. of road............	Purchase 1907....	8.75
do ...	10	E. part 19.12 ch. on N. and 9.5 ch. on S. line..................	Purchase 1907....	93.73
do ...	11	....	Purchase 1907....	300.00
do ...	12	Ex. parcels of 26a. and 10a. along Piseco road................	Purchase 1907....	264.00
do ...	13	N. E. cor. 33c 52l. N'ly & S'ly, and 14c. 91¼l. E'ly & W'ly....	Purchase 1907....	50
do ...	14	Ex. 200a. S. pt. (Ballou)	1885, '90.........	100
do ...	15	....	1843*............	120
do ...	16	....	1877, '81, '85, '90, '95............	120
do ...	17	....	1877, '81, '85, '90, '95............	300
do ...	20	N. E. part....................	Purchase 1897....	35
		Total, Bethune Tract, 2,550.48 acres.		
		MAXWELL TRACT,		
do ...	3	Ex. 75a. N. E. cor.............	Purchase 1898....	225
do ...	4	E. pt. of 80a. N. pt. and S. W. cor.	1885, '90 and pur. 1898...........	55
do ...	7	S. ½.........................	Pur. 1899 & 1905..	150
do ...	8	N. ½.........................	Pur. 1899 & 1905..	150
do ...	12	S. E. cor. 20c. 75l. wide N'ly & S'ly & 29c. long E'ly & W'ly..	Purchase 1907....	60
do ...	13	W. ½ of 230a. N. part and parcel bd. N. by Romel, E. & S. by highway & W. by lot line, 21a.	Purchase 1898 & 1895, '00.......	136

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* Resale 1861.

HAMILTON COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		ARTHURBORO PATENT, SOUTH HALF, MAXWELL TRACT — (*Continued*)		
Morehouse...	14	W. ½ of 240a. S. pt............	Pur. 1898 & 1900..	120
do ...	19	N. pt. 140a. & 19½a. N. W. cor. of rem. 16c. 54l. N. & S. & 11c. 64l. E. & W................	Pur. 1899 & 1905..	159.25
do ...	20	Ex. 50a. N. W. cor. & 41a. N. E. cor........................	Pur. 1899 & 1905..	211.56
		Total, Maxwell Tract, 1,266.71 acres.		
		ARTHURBORO PATENT, SOUTH HALF, MOREHOUSE 8,000 ACRE TRACT,		
do ...	2	S. end........................	1877, '81, '85.....	50
do ...	4	....	Pur. 1901 & 1900, '05............	200
do ...	5	....	Pur. 1901 & 1900, '05............	200
do ...	6	....	Purchase 1897....	200
do ...	7	....	Purchase 1897....	200
do ...	8	S. ½........................	Purchase 1897....	100
do ...	11	E. ½........................	Purchase 1897....	100
do ...	12	....	Pur. 1901 & 1900, '05............	200
do ...	13	S. W. cor.....................	1877, '95.........	45
do ...	17	S. ½........................	1877, '81, '85, '90..	100
do ...	20	S. ½........................	Pur. 1901 & 1900, '05............	100
do ...	21	....	Purchase 1919....	200
do ...	26	N. ½........................	Pur. 1901 & 1900, '05............	100
do ...	27	....	Pur. 1901 & 1900, '05............	200
do ...	28	W. ½........................	Pur. 1901 & 1900, '05............	100
do ...	29	....	Pur. 1901 & 1900, '05............	200
do ...	30	....	Pur. 1901 & 1900, '05............	200
do ...	32	Ex. 28a. b'd S. by road.........	Purchase 1897....	172

HAMILTON COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		ARTHURBORO PATENT, SOUTH ½, MOREHOUSE 8,000 ACRE TRACT — (*Continued*)		
Morehouse	33		Pur. 1901 & 1900, '05	200
do	34	E. ½ ex. 56a. N. pt	1885, '90	44
do	35	Ex. 33a. S. end of E. ½	Purchase 1919 & 1877, '81, '85, '90, '05	167
do	36	Ex. reservoir	Purchase 1919	187
do	37	Ex. reservoir	Purchase 1919	174
do	38	Ex. reservoir	Purchase 1919	136
do	40	N. end	1877, '81, '85, '95	38
		Total, Morehouse Tract 3,613 acres.		
		ARTHURBORO PATENT S. ½ — TIFFT (J. G.) TRACT,		
Morehouse	...	E. pt. bd. W. by lot 3	1877, '81, '85, '90, '95	1,525
do	1	Ex. 50a. square, N. W. cor	Purchase 1898	255
do	2	Ex. 100a. E'ly pt	Pur. 1898 & 1900	205
do	3		Purchase 1898	305
		Total, Tifft Tract, 2,290 acres.		
		BENSON TOWNSHIP,		
Benson	4	Mid. part b'd. N. by road, S. by S. line of lot (Anibal)	Mortgage and Conveyed 1919	68.81
do	9		1877, '81, '85	160
do	10	S. pt. or S. ½	1881, '85, '95	80
do	14		1877, '81, '85	160
do	15		1877, '81, '85 and Purchase 1897	160
do	16		Pur. 1908 & 1910	160
do	17		Pur. 1908 & 1910	160
do	18		Pur. 1908 & 1910	160
do	19		1881, '85, '90	160
do	20		Pur. 1891 & 1895	160
do	21		Pur. 1891 & 1895	170
do	22		Pur. 1891 & 1895	160
do	23		Pur. 1891 & 1895	160
do	24	All in Benson	1895, '00	80

HAMILTON COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		BENSON TOWNSHIP — (*Continued*)		
Arietta	24	All in Arietta	Purchase 1897	80
do	25		1890, '95	160
do	26		1885, '90	160
do	27		1881, '85, '90	160
do	28		1877, '81, '85	160
do	29		1877, '81, '85	160
do	30		1881, '85	214
do	32		1881, '85	160
do	33		1881, '85	160
do	34		1881, '85	160
do	35		Purchase 1897	160
do	36		Purchase 1897	160
do	37	All in Arietta	Purchase 1897	80
Benson	37	All in Benson	Purchase 1897	80
do	38		Pur. 1891 & 1895	160
do	39		Pur. 1891 & 1895	160
do	40		1890, '95	160
do	41		1885, '90	160
do	42		1881, '85, '90	160
do	43		1877, '81, '85, '95	160
do	44		1881, '85, '90	160
do	45		1877, '81, '85, '90	160
do	46		1877, '81, '85	160
do	47		Purchase 1901	160
do	51		Pur. 1902 & 1905	160
do	52		Purchase 1900	160
do	53	N. end across	Purchase 1902	105
do	62		1853, '71, '77, '81	160
do	63		Purchase 1918 and 1853, '71, '81, '85	160
do	68		1877, '81, '85, '90	160
do	69		1877, '81, '85	160
do	72		Pur. 1907 & 1905	160
do	74		1890	160
do	75		1877, '81, '85, '90	160
do	77		1877, '81, '85	160
do	78		1877, '81, '85, '90	160
do	79		1877, '81, '85, '90	160
do	80		1885, '90	160
do	81		Pur. 1891 and 1895.	160
do	82		Pur. 1891 and 1895.	160
do	83		1885, '90	160

HAMILTON COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		BENSON TOWNSHIP — (*Continued*)		
Arietta	84	All in Arietta	1881	80
Benson	84	All in Benson	1881, '85, '90, '95	80
Arietta	85		1877, '81, '85, '90	160
do	86		Purchase 1897	160
do	87		1881, '85, '90	160
do	88		1881, '85, '90	160
do	90	A parcel conveyed by Wm. A. Palmer to Wm. Claflin	Purchase 1901	106
do	91		1877	160
do	92		1877, '85	160
do	93		Pur. 1907 & 1905	160
do	94		Purchase 1897	160
do	95	All in Arietta	1881	80
Benson	95	All in Benson	1881, '85, '90, '95	80
do	96		Pur. 1900 & 1900, '05	160
do	97		1881, '85, '90	160
do	98		Pur. 1891 & 1895	160
do	99		Purchase 1891	160
do	100		1877, '81, '85, '90	160
do	101		1877, '81, '85, '90	160
do	102		1877, '81, '85	160
do	103		1885, '90	160
do	104		1877, '81, '85, '90	160
do	106		1885, '90, '95	160
do	107		Purchase 1897	160
do	108		Appropriated 1919	160
do	109		Purchase 1901	160
do	110		1877, '81, '85, '90	160
do	111		Pur. 1908 & 1885, '90, '10	160
do	112		Purchase 1897	160
do	113	W. pt. across	1890, '95	90
do	115		Appropriated 1919	160
do	116		Purchase 1901	160
do	117	Ex. 70a. S. pt.	1885, '90	114
do	118		1853, '81, '85	248
do	119		Purchase 1891	160
do	120	N. pt. 40a. ex. und. ½	1877, '81, '85	30
do	121		1871, '77, '81	160
do	123		1871, '85	160
do	124		Purchase 1901	160

HAMILTON COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		BENSON TOWNSHIP — (*Continued*)		
Benson	125		Purchase 1900	160
do	126		1890, '95	160
do	127		1885, '90	160
do	128		1885, '90	160
do	129		Purchase 1901	160
do	130		Purchase 1898	160
do	131		1877, '81, '85, '90	160
do	132		1885, '90	160
do	133		Pur. 1900 & 1905	160
do	134		Pur. 1900 & 1905	160
do	135		Pur. 1900 & 1905	160
do	136		Pur. 1891 & 1895	160
do	137		1881, '85, '90	160
do	138		Purchase 1897	160
Arietta	139	All in Arietta	Pur. 1891 & 1895	80
Benson	139	All in Benson	Pur. 1891 & 1895	80
Arietta	140		Pur. 1891 & 1895	160
do	141		Purchase 1897	160
do	142		Pur. 1898 & 1900	160
do	143		Purchase 1897	178
do	144		Purchase 1897	92
do	145		1871, '77, '81	160
do	146		Purchase 1897	160
do	147		1871, '77, '81	160
Benson	148	All in Arietta	Pur. 1891 & 1895	80
do	148	All in Benson	Pur. 1891 & 1895	80
do	149		1871, '77, '81	160
do	150		1877, '81, '85	160
do	151		Purchase 1891	160
do	152		1881, '85, '90	160
do	153		1881, '85, '90	160
do	154		1881, '85, '90	160
do	155		1877, '81, '85, '90	160
do	156		1877, '81,' 85, '90	160
do	157		1877, '81, '85, '90	160
do	158		1877, '85	160
do	159		1890, '95	160
do	162		1885, '90, '95	160
do	163	Und. ½	1877, '81, '85, '90	80
do	168		1877, '81, '85, '90	160
do	169		1881, '85, 90	154
do	170		Purchase 1897	220

HAMILTON COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		BENSON TOWNSHIP — (*Continued*)		
Benson	171		1877, '81, '85 & conveyed 1905	160
do	177		1877, '81, '85, '90, '95	160
do	179		1877, '81, '85, '90	160
do	180		1877, '81, '85	160
do	181		1877, '81, '85, '90	160
do	182		1881, '85, '90	160
do	183		1881, '85, '90	160
do	184		1877, '81, '85, '90, '95	160
do	185		1890, '95	160
do	186		1890, '95	160
do	187		1843, '00*	160
do	188		1877, '81, '85	160
do	189		1877, '81, '85, '90	160
Arietta	190	All in Arietta	1877, '81	80
Benson	190	All in Benson	1881, '95	80
Arietta	191		1871, '77, '81	160
do	192		Purchase 1897	160
do	193		Purchase 1897	176
do	194		Purchase 1897	262
do	195		1877, '81, '85	160
do	196	All in Arietta	1881	80
Benson	196	All in Benson	1881, '85, '90	80
do	197		1877, '81, '85	160
do	198		1877, '81, '85	160
do	199		1890, '95	160
do	200		Pur. 1901 & 1900, '05	160
do	201		1843, '00*	160
do	202		1877, '81, '85, '95	160
do	203		1843, '59, '00*	160
do	204		1877, '81, '85, '90	160
do	205		1877, '81, '85, '90	160
do	206		1877, '81, '85	160
do	207		1877, '81, '85	160
do	208		1843, '59, '00*	160
do	209		1843, '59, '00*	160
do	210		1843, '00*	160

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* Resale, 1899.

HAMILTON COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		BENSON TOWNSHIP — (*Continued*)		
Benson......	211	....	1881, '85, '90......	160
do	213	....	1881, '85, 90......	160
do	214	....	1877, '81, '85, '90..	160
do	215	....	1881, '85, '90......	160
do	216	....	1890, '95..........	120
do	217	....	1871, '77, '81, '85..	184
do	218	....	1871, '77, '81......	160
do	219	....	1871, '77, '81......	160
do	220	....	1871, '77, '81, '85..	160
do	221	....	Pur. 1900 & 1900, '05............	160
do	222	....	1877, '81, '85, '90..	160
do	223	....	1877, '81, '85, '90..	160
do	224	....	1877, '81, '85, '90..	160
do	225	....	1877, '81, '85, '90..	160
do	226	....	Pur. 1907 & 1905..	160
do	227	....	Pur. 1907 & 1905..	160
do	228	....	1877, '81, '85, '90, '95............	160
do	229	....	1881, '85, '90, '95..	160
do	230	....	1877, '81, '85, '90, '95 and pur. 1897	160
do	231	....	1877, '81, '85......	160
do	232	....	Pur. 1901 & 1900 '05............	160
do	233	....	Pur. 1901 & 1900, '05............	160
do	234	....	1890, '95..........	160
do	235	....	Pur. 1891 & 1895..	160
Arietta......	236	All in Arietta..............	Pur. 1891 & 1895..	80
Benson......	236	All in Benson...............	Pur. 1891 & 1895..	80
Arietta......	237	....	Pur. 1891 & 1895..	160
do	238	....	Pur. 1891 & 1895..	172
do	239	....	Pur. 1891 & 1895..	234
do	240	All in Arietta..............	Pur. 1891 & 1895..	80
Benson......	240	All in Benson...............	Pur. 1891. & 1895..	80
do	241	....	Pur. 1891 & 1895..	160
do	242	....	Pur. 1891 & 1895..	160
do	243	....	1881, '85, '90, '95..	160
do	244	....	1877, '81, '85......	160
do	245	....	1877, '81, '85......	160

HAMILTON COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		BENSON TOWNSHIP — (*Continued*)		
Benson	246		1877,'81,'85,'90,'95.	160
do	247		1877,'81,'85,'90,'95.	160
do	248		1885, '90, '95	160
do	249		1885, '90	160
do	250		1885, '90	160
do	251		1885, '90	160
do	252		1877,'81,'85,'90,'95.	160
do	253		1877,'81,'85,'90,'95.	160
do	254		1877,'81,'85,'90,'95.	160
do	255		1877, '81, '85	160
do	256		1871, '77, '81, '90	160
do	257		1871, '77, '81, '85	160
do	258		1877, '81, '90	250
do	259		1871, '77, '81, '90	160
do	260		1877, '81, '85	160
do	261		1881, '85, '90	160
do	262		1877, '81, '85	160
do	263		1877,'81,'85,'90,'95.	160
do	264		1890, '95	160
do	265		1877,'81,'85,'90,'95,	160
do	266		1885, '90, '95	160
do	267		1881, '85, '90	160
do	268		1885, '90	160
do	269		1877, '91, '85	160
do	270		1885, '90	160
do	271		1877, '81, '85	160
do	272		1881, '85, '90	160
do	273		1877, '81, '85, '90	160
do	274		1881, '85, '90, '95	160
do	275		1881, '85, '90	160
do	276		1881, '85, '90, '95	160
do	277	All in Benson	1890, '95	80
Arietta	277	All in Arietta	Purchase 1897	80
do	278		1890, '05	146
do	279	All in Arietta	Pur. 1891 & 1895	138
Benson	279	All in Benson	Purchase 1906	80
do	280		Conveyed & 1895	160
do	281		1881, '85, '90, '95	160
do	282		1885, '90, '95	160
do	283		1885, '90	160
do	284		1885, '90	160
do	285		1881, '85, '90	160

HAMILTON COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		BENSON TOWNSHIP — (*Continued*)		
Benson	286		1881, ’85, ’90	160
do	287		1877, ’81, ’85, ’90	160
do	288		1881, ’85, ’90, ’95	160
do	289		1885, ’90, ’95	160
do	290		1885, ’90	160
do	291		1877, ’81, ’85, ’90, ’95	160
do	292		1877, ’81, ’85, ’90, ’95	160
do	293		1877, ’81, ’85, ’90, ’95	160
do	294		1877, ’81, ’85	160
do	295		1881, ’85, ’90, ’95	160
do	296		1977, ’81, ’85	210
do	297		1877, ’81, ’85	92
do	298		1877, ’81,’85, ’90	160
do	299		1877, ’81, ’85, ’90	160
do	300		1877, ’81, ’85	160
do	301		1877, ’81, ’85	160
do	302		1877, ’81, ’85, ’90	160
do	303		1877, ’81, ’85	160
do	304		1885, ’90	160
do	305		1881, ’85, ’90, ’95	160
do	306		1885, ’90	160
do	307		1877, ’81, ’85	160
do	308		1881, ’85, ’90	160
do	309		Purchase 1898	160
do	310		1881, ’85, ’90	160
do	311		1881, ’85, ’90, ’95	160
do	312		Pur. 1891 & 1895	160
do	313		Pur. 1891 & 1895	160
Arietta	314	All in Arietta	Pur. 1891 & 1895	50
Benson	314	All in Benson	Pur. 1891 & 1895	80
do	315		Pur. 1891 & 1895	204
do	316		1885, ’90, ’95 & conveyed 1905	160
do	317		1881, ’85, ’90, ’95	160
do	318		1881, ’85, ’90, ’95	160
do	319		1881, ’85, ’90, ’95	160
do	320		1877, ’81, ’85	160
do	321		1877, ’81, ’85	160
do	322		1877, ’81, ’85	160

HAMILTON COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		BENSON TOWNSHIP — (*Continued*)		
Benson	323		1877, '81, '85	160
do	324		1881, '85, '90	160
do	325		1877, '81, '85	160
do	326		1885, '90, '95	160
do	327		1877, '81, '85	160
do	328		1877, '81, '85	160
do	329		1871, '77, '81, '85	160
do	330		1877,'81,'85.'90,'95.	148
Wells	331		1877, '81, '85	206
do	332		1877	160
do	333		1877,'81,'85,'90,'95.	160
do	334		1881, '85, '90	160
do	335		1881, '85, '90	160
do	336		1877, '81, '85	160
do	337		1881, '85, '90	160
do	338		1877,'81,'85,'90,'95.	160
do	339		Purchase 1898	160
do	340		1881, '85, '90	160
do	341		1881, '85, '90	160
do	342		Purchase 1898	160
do	343		Pur. 1891 & 1895	160
do	344		1881, '85, '90, '95	160
do	345		1877,'81,'85,'90,'95.	122
do	346		1885, '90	197
do	347		1881, '85, '90	160
do	348		Purchase 1897	160
do	349		1890, 1895	160
do	350		1881, '85, '90	160
do	351		1877, '81, '85	160
do	352		1877, '81, '85	160
do	353		1877, '81, '85	160
do	354		1877, '81, '85	160
do	355		1877, '81, '85	160
do	356		1885	160
do	357	Ex. so much of 50a. S. E. cor. as is not contained in 100a. W. pt. of lot	1877, '81,' 85, '95	126
do	358		1877, '81, '85	160
do	360		1877, '81	164
do	361		1877, '81, '85, '90	160
do	362		1877, '81, '85	160
do	366	E'ly side	Appropriated 1919.	50

HAMILTON COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		BENSON TOWNSHIP — (*Continued*)		
Wells	368		1877, '81, '85	160
do	369		Purchase 1898	160
do	370		Purchase 1898	160
do	371		Purchase 1898	160
do	372		1890, '95	107
do	373		1885, '90	182
do	374		1871, '81, '85, '90	160
do	375		1877, '81, '85	160
do	376		1871, '77, '81	160
do	377		1871, '77, '81	160
do	378		1877, '81, '85	160
do	379		1877, '81, '85	160
do	380		1877, '81, '85	160
do	381		Appropriated 1919	160
do	382		1871, '77, '81	154
		Total, Benson Township, 52,353.81 acres.		
		BERGEN'S PURCHASE, PATENT No. 1,		
do	7	S. end	1871	10
do	9		1877, '81	100
do	11		1853, '85	100
		PATENT No. 2,		
do		S. W. cor. 57 ch. E. & W. & 20 ch. N. & S	1881, '85, '90	114
do		All E. of E. Br. of Sacandaga Riv. ex. 25a. N. E. cor. 25 ch. N. & S. and 10 ch. E. & W.; 80a. S. E. cor. 40 ch. N. & S. and 20 ch. E. & W.; 33a. b'd W. by River, S. by Pat. line 12 ch. N. & S., 33 ch. on Pat. line	Purchase 1897	195
		PATENT No. 3,		
do		All E. of both branches of Sacandaga river, 650a., ex. 126a, bd. beg. on E. bank of E. branch of river on line of Patents 2 & 3, th. N. 63 deg.		

HAMILTON COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		BERGEN'S PURCHASE, PATENT No. 3 — (*Continued*)		
		E. along said line 30c., th. S. 27 deg. E. 30c., th. S. 63 deg. W. 54c. to E bank of E. branch, and th. N'ly along bank to beg.	1890, '95	524
Wells		All W. of both branches of Sacandaga River, 629a., ex. 100a. bd. beg. in center of W. branch of river on line of Patents 2 & 3, th. S. 63 deg. W. 32c., th. S. 27 deg. E. 30c., th. N. 63 deg. E. 38c. to W'ly bank of W. branch, & Th. N'ly up same to beg.	1890, '95	529
do		Parcel between E. and W. branches of Sacandaga River at forks	Purchase 1899	25
		PATENT No. 4.		
Hope		All in Hope	1877, '81, '85	107
Wells		All in Wells	1885, '90	580
		PATENT No. 5.		
Hope	1		1871, '77, '85	273
do	2		1871, '77	273
do	3		1871, '77, '81, '85	273
do	4	All N. of river ex. 10a. (Colomb) and 50a. (Murray) N. end	Purchase 1901	190
		PATENT No. 6, (East Side of Sacandaga River)		
		East Part of North ½		
do	1	Sturges' lot	1877, '81	100
do	2		1877, '81 & Conveyed 1917	100
do	4	W. pt.	1871	175
		East Part of South ½		
do	1	Sturges' lot	1877	100
do	2	Sturges' lot	1877	100
		(West Side of Sacandaga River)		
do		All	1871, '77	668

HAMILTON COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		BERGEN'S PURCHASE—(*Continued*) PATENT No. 7		
Hope	1, 2, 3 & 4	Sub. 1, W. end	1885	90
		Sub. 2, W. of river	Purchase 1901	133.50
		Sub. 4, W. end	1890	33.33
		Sub. 5, W. end	1890	33.33
		Sub. 6, W. end	1890	33.33
		Sub. 7	1890	90
		Sub. 9	1881, 1890	100
do	5		1854, '77, '81, '85, '90	273
do	6		1854, '77, '81	273
		PATENTS Nos. 8 & 9,		
do	4	E. of road ex. school house lot ½a.	Purchase 1919	125.38
do	5	E. of road bd. S. by Ashton line.	Purchase 1919	39
do	7		1848	108
do	11	N. W'ly ½	1853	54
do	12		1848	108
do	13		1890, '95	135
do	14		Purchase 1897	136
do	15		Purchase 1897	135
do	16	N. of highway	Purchase 1897	123
		PATENT No. 10,		
do	2	Bd. N. by lands of E. H. Willard, E. by same & J. T. N. Russell, S. by J. Williams & W. by D. Stickney	1890	100
		PATENT No. 11,		
do	5	Ex. 30a. S. W. & 25a. N. W.	1853	218
		PATENT No. 13,		
do	12		1890	241
		Total, Bergen's Purchase, 7,117.87 acres.		

HAMILTON COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		BROWN'S (JOHN) TRACT TOWNSHIP 8,		
Inlet	C	All in Ham. Co.	Purchase 1896	463
do	K	All in Hamilton Co.	Purchase 1897	1,171.71
		Total, Twp. 8, 1,634.71 acres.		
		CALDWELL & OTHERS' TRACT,		
Morehouse	1		Pur. 1901 & 1900, '05	600
do	2		Pur. 1899 & 1905	200
do	3		Pur. 1899 & 1905	200
do	4		Pur. 1899 & 1905	600
do	5		Pur. 1899 & 1905	200
do	6		Pur. 1899 & 1905	200
do	7		Pur. 1899 & 1905	200
do	8		Pur. 1899 & 1905	200
do	9		Pur. 1899 & 1905	200
do	10		Pur. 1901 & 1900, '05	200
do	11		1885, '90, '95	200
		Total, Caldwell & Others' Tract, 3,000 acres.		
		CHASE'S PATENT		
Benson	91	E. pt. in Benson	1881	15
do	101	All in Hamilton County	1871, '77, '81, '85	90
do	102		1871, '77, '81, '85	100
do	103	All in Hamilton County	1871, '81, '85	85
do	105		1871, '77, '81	100
do	106		1871, '77, '81	100
do	107		1877, '81, '85	100
do	108		1871, '77, '81	100
do	116	N'ly pt	1871	40
do	117		1871, '77, '81, '85	100
do	118		1871, '77, '81, '85	100
do	119		1871, '77, '81, '85	100
do	120		1871, '77, '81	100
		Total, Chase's Patent, 1,130 acres.		

HAMILTON COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		GLEN, BLEECKER & LANSING PATENT,		
Benson	1	Sub. 2, S. ½	Purchase 1898	55
do	1	Sub. 3	1871, '77, '81	111
do	1	Sub. 4	1871, '77, '81	111
do	1	Sub. 5	Purchase 1898	111
do	1	Sub. 6	1871, '77, '81	111
do	1	Sub. 7	1871, '77, '81	109
do	1	Sub. 8	1871, '77, '81	111
do	1	Sub. 9	1871, '77, '81, '00	111
do	2	Sub. 5	1877, '81, '85	125
do	2	Sub. 6	1871, '77	125
do	2	Sub. 7	1871, '81	125
do	2	Sub. 8	1871, '77, '81	125
do	6	Sub. 1	1877,'81,'85,'90,'95.	100
do	6	Sub. 2	1871, '77, '81	100
do	6	Sub. 3	1871, '77, '81, '85	100
do	6	Sub. 4	1871, '77, '81, '85 & Conveyed 1897	100
do	6	Sub. 6, N. ½	1871, '81, '85	50
do	7		1881, '85, '90	1,000
do	8	Sub. 1, N. pt.	1885	56
do	8	Sub. 1, S. pt.	1871, '81	60
do	8	Sub. 2	1877, '81, '85, '90	150
do	8	Sub. 3	1877, '81, '85, '90	150
do	8	Sub. 6	1871, '77, '81	220
do	8	Sub. 7	1871, '81, '85	101
do	9	Sub. 1	1877, '81, '85	100
do	9	Sub. 2	1877, '81, '85	100
do	9	Sub. 3	1871, '77, '81, '85	95.50
do	9	Sub. 4	1871, '77, '81	95
do	34	All in Hamilton County	Purchase 1897	100
		Total, 4,007½ acres		
		GORES.		
		GORE BET. MOOSE RIVER TRACT, OXBOW TRACT AND TOWNSHIPS 1 & 2, TOTTEN & CROSSFIELD'S PURCHASE — (*Jones Gore*)		
L. Pleasant	10		Purchase 1898	124.87
do	11		Purchase 1898	182.07
do	12		Purchase 1898	207
do	13		Purchase 1898	236.34
		Total, Jones Gore, 750.28 acres.		

HAMILTON COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		GORE NORTH OF LAWRENCE PATENT		
Arietta......	.....	All that tract of land bounded N'ly by Oxbow Tract, W'ly by Arthurboro Patent, S'ly by Lawrence Patent, and E'ly by Benson Township...........	Original..........	1,180
		GORE BETWEEN TOWNSHIPS 29 & 31, TOTTEN & CROSSFIELD'S PURCHASE		
Wells........	1	....	Pur. 1891 & 1895..	169.60
do	2	....	Pur. 1891 & 1895..	169.60
do	3	....	Pur. 1891 & 1895..	169.60
do	4	....	Pur. 1891 & 1895..	169.60
do	5	....	Pur. 1891 & 1905..	169.60
do	6	....	Pur. 1891 & 1895..	169.60
do	7	All in Hamilton Co............	Purchase 1891.....	131
do	8	All in Hamilton Co............	Purchase 1891.....	11.80
		Total, Gore between Townships 29 & 31, 1,160.40 acres.		
		LAWRENCE PATENT		
Arietta and Morehouse.	.....	Gore (Brayhouse), 2,493.35a. ex. 276a. N. of Lot 90 of Jerseyfield Pat. and ex. 520.12a. W. end........................	Purchase 1901....	1,697.35
Morehouse...	.....	Gore, unallotted, W. of lot 36...	Purchase 1901....	33.93
do ...	.....	Gore, unallotted, E. of lot 13, S. of 49 and S. & E. of 36.......	Purchase 1901....	210.23
do ...	.....	Gore, unallotted, S. E. of lots 13 and 56....................	Purchase 1901....	105.11
do ...	.....	Gore, unallotted S. of lot 56....	Purchase 1901....	75.91
do ...	.....	Gore, unallotted, S. of lots 50 and 51....................	Purchase 1901....	105.11
do ...	.....	Gore, unallotted, S. of lots 52 and 55....................	Purchase 1901....	105.11
do ...	.....	Gore, unallotted, S. of lot 55....	Purchase 1901....	76.91
do ...	.....	Gore, unallotted, S. of lots 54 and 55....................	Purchase 1901....	105.11
do ...	.....	Gore, unallotted, S. of lot 54....	Purchase 1901....	76.91
Arietta......	1	....	Purchase 1897....	635.00
do	2	....	1881, '85, '90.....	635.00

HAMILTON COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		LAWRENCE PATENT — (*Continued*)		
Arietta	3	....	1890, '95..........	635.00
do	4	....	Purchase 1897....	635.00
do	5	....	Purchase 1897....	635 00
do	6	....	1877, '81, '85, '95..	635.00
do	7	....	1877, '81, '85, '95..	756.00
do	8	....	Pur. 1900 & 1905..	514.00
do	9	....	Purchase & 1881, '85, '00, '05.....	635.00
do	10	All in Arietta................	Pur. 1900 & '05...	20.00
Morehouse...	10	All in Morehouse ex. 100a. W. part......................	Pur. 1900 & 1905..	515.00
do ...	13	....	Purchase 1897....	168.60
do ...	14	....	Pur. 1900 & 1877, '81, '95, '05.....	599.30
do ...	15	All in Morehouse.............	Purchase 1900 & 1905..........	615.00
Arietta......	15	All in Arietta................	Pur. 1900 & 1905..	20.00
do	16	....	Pur. 1900 & 1905..	635.00
do	17	....	Pur. 1900 & 1905..	635.00
do	18	....	Pur. 1900 & 1905..	778.00
do	19	....	1877, '81, '85......	492.00
do	20	....	Pur. 1900 & 1905..	635.00
do	21	....	1890, '95, '00......	635 00
do	22	....	1877, '81, '85......	635.00
do	23	....	Pur. 1901 & 1900, '05............	635.00
do	24	....	Pur. 1901 & 1900, '05............	635.00
do	25	....	Purchase 1898.....	635.00
do	26	....	1877, '81, '85......	635 00
do	28	....	1890. '95,........	635.00
do	29	....	1881, '90.........	492.00
do	30	....	1890, '95.........	778.00
do	31	....	Pur. 1900 & 1905..	635.00
do	32	....	Pur. 1900 & 1905..	635.00
do	33	....	Pur. 1900 & 1885, 1890..........	635.00
Morehouse & Arietta......	34	....	Pur. 1900 & 1905..	492.00
Morehouse...	35	....	1877, '81, '85......	635.00
do ...	36	....	1877, '81, '85, '90, '95............	670.70

HAMILTON COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		LAWRENCE PATENT — (*Continued*)		
Arietta	37		Purchase 1898	504.30
do	38		1885, '90, '95	492.30
do	39	Ex. 31.62a. N. W. cor sq	Purchase 1897	438.10
do	40		Pur. 1901 & 1900	468.20
do	41		1890, '95	456.20
do	42		Purchase 1897	444.20
do	43	Ex. 100a. S. W. cor	Pur. 1906 & 1881, '85, '90, '10	332.20
do	44		Pur. 1900 & 1905	420.10
do	45		Purchase 1900	408.10
Arietta and Morehouse	46		Pur. 1900 & 1905	544.80
Morehouse	47		Pur. 1900 & 1905	401.30
do	48		Pur. 1900 & 1905	395.80
do	49		Pur. 1900 & 1905	404.20
do	50		1885, '90, '95	403.60
do	51		1885, '90	403.00
do	52		1885, '90, '95	194.40
do	53		1885, '90, '95	402 50
do	54		Pur. 1900 & 1900, '05	635.00
do	55		Pur. 1901 & 1900, '05	635.00
do	56		Pur. 1901 & 1900, '05	563.60
		Total, Lawrence Patent, 31,784.06 acres.		
		LEWIS (MORGAN) SMALL TRACT,		
Benson	2		1848	100
		MOOSE RIVER TRACT, TOWNSHIP 3,		
Inlet	42	Dam site lot	Appropriated 1880	1.80
do	65	Und. ½ of all in Inlet	1881, '85	42
do	79		1881, '85, '90 and purchase 1898	168
do	91		1881, '85, '90 and purchase 1898	168
do	103		1881, '85, '90 and purchase 1898	168
		Total, Township 3, 547.80 acres.		

HAMILTON COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		MOOSE RIVER TRACT—(*Cont'd*) TOWNSHIP 4,		
Inlet	7		1885, '90	168
do	8		1885, '90, '95	168
do	9		1885, '90, '95	168
do	10		1885, '90, '95	168
do	15		1885, '90, '00 & purchase 1895	160
do	16		1885, '90	160
do	17		1885, '90, '00 & purchase 1895	160
do	18	All in Inlet	1885, '90	154
Morehouse	18	All in Morehouse	1885, '90	6
do	31	All in Morehouse	1885, '90, '00 & purchase 1895	.22
Inlet	31	All in Inlet	1885, '90, '00 & purchase 1895	159.78
Inlet	32		1881, '85, '90, '00 & purchase 1895	160
do	33		1881, '85, '90, '00 & purchase 1895	160
do	34		1881, '85, '90, '00	160
do	39		1881, '85, '90, '00 & purchase 1895	160
do	40		1881, '85, '90, '00 & purchase 1895	160
do	41		1881, '85, '90, '00 & purchase 1895	160
do	42	All in Inlet	1885, '90, '00 & purchase 1895	113
Morehouse	42	All in Morehouse	1885, '90, '00 & purchase 1895	47
do	55	All in Morehouse	1885, '90, '00 & purchase 1895	180.95
Inlet	55	All in Inlet	1885, '90, '00 & purchase 1895	31
do	56	All in Inlet	1885, '90, '00 & purchase, 1901	164.75
Morehouse	56	All in Morehouse	1885, '90, '00 & purchase, 1901	47.25
Inlet	57		1885, '90 & purchase 1895	212
do	64	All in Inlet	1881, '85, '90, '00 & purchase 1895	163.13

HAMILTON COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		MOOSE RIVER TRACT, TOWNSHIP 4—(*Continued*)		
Morehouse...	64	All in Morehouse..............	1881, '85, '90, '00 & purchase 1895.	49.87
do ...	65	All in Morehouse..............	1881, '85, '90, '00 & purchase 1895.	207
Inlet.........	65	All in Inlet..................	1881, '85, '90, '00 & purchase 1895.	6
Morehouse...	66	....	1881, '85, '90 & purchase 1895...	213
do ...	79	....	1881, '85, '90.....	213
do ...	81	Und. ⅓ of all in Morehouse.....	Purchase 1899....	55.50
Inlet.........	81	Und. ⅓ of all in Inlet...........	Purchase 1899....	15.50
do	82	All in Inlet..................	Pur. 1895 & 1900..	208
Morehouse...	82	All in Morehouse..............	Pur. 1895 & 1900..	5
Inlet.........	83	....	1881, '85, '90 & purchase 1898...	213
do	84	....	1881, '85, '90 & purchase 1898...	213
do	85	....	Purchase 1898....	213
do	86	....	Purchase 1898....	213
do	87	All in Inlet..................	1881, '85, '90 & Purchase 1899...	63
Morehouse...	87	All in Morehouse..............	1881, '85, '90 & purchase 1899...	150
do ...	88	....	1881, '85, '90 & purchase 1899...	213
do ...	89	....	1885, '90, '95 & purchase 1899...	213
do ...	90	....	Purchase 1898....	213
do ...	97	....	1881, '85, '90 & purchase 1898...	213
do ...	98	....	1881, '85, '90 & purchase 1898...	213
do ...	99	....	1881, '85, '90 & purchase 1898...	213
do ...	100	....	Purchase 1898....	213
do ...	101	All in Morehouse..............	Purchase 1898....	106.50
Inlet.........	101	All in Inlet..................	Purchase 1898....	106.50
do	102	....	Pur. 1898 & 1900..	213
do	103	All in Inlet..................	Purchase 1898....	134
Morehouse...	103	All in Morehouse..............	Purchase 1898....	30
do ...	104	All in Morehouse..............	Purchase 1898....	180.70
Inlet.........	104	All in Inlet..................	Purchase 1898....	32.30

HAMILTON COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		MOOSE RIVER TRACT, TOWNSHIP 4 — (*Continued*)		
Morehouse...	105	....	1881, '85, '90 & purchase 1898...	213
do ...	106	....	1881, '85, '90 & purchase 1898...	213
do ...	107	....	1881, '85, '90 & purchase 1898...	213
do ...	108	....	Purchase 1898....	213
		Total Township 4, 8,574.95 acres.		
		MOOSE RIVER TRACT, TOWNSHIP 7,		
Morehouse...	1	....	Purchase 1900....	198
do ...	2	....	Purchase 1900....	160
do ...	23	....	Purchase 1900....	160
do ...	24	....	Purchase 1900....	200
do ...	25	....	Purchase 1900....	200
do ...	26	....	Purchase 1900....	160
do ...	47	....	Purchase 1900....	160
do ...	48	....	Purchase 1900....	200
do ...	49	....	Purchase 1900....	200
do ...	50	....	Purchase 1900....	160
do ...	71	....	Purchase 1900....	160
do ...	72	....	Purchase 1900....	200
do ...	73	....	Purchase 1900....	200
do ...	74	....	Purchase 1900....	160
do ...	95	....	Purchase 1900....	160
do ...	96	....	Purchase 1900....	200
do ...	97	....	Purchase 1900....	200
do ...	98	....	Purchase 1900....	160
do ...	119	....	Purchase 1900....	160
do ...	120	....	Purchase 1900....	115.75
		Total, Township 7, 3,513¾ acres.		
		MOOSE RIVER TRACT, TOWNSHIP 8		
Arietta......	...	All in Arietta, 12,836.9a. ex. 4,039.4a. being all in Arietta of 5,000a. sq. in N. E. cor. of township..................	Pur. 1900 & 1905.	8,797.50

HAMILTON COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		MOOSE RIVER TRACT, TOWNSHIP 8 — (*Continued*)		
Morehouse...	...	All in Morehouse, 10,952.3a. ex. 960$\frac{8}{10}$a., being all in Morehouse of 5,000a. sq. in N. E. cor. of Township..................	Pur. 1900 & 1905.	9,991.50
		Total, Township 8, 18,789 acres.		
		MOOSE RIVER TRACT, TOWNSHIP 9		
do ...	1	....	Purchase 1898....	174
Arietta......	2	All in Arietta................	Pur. 1907 & 1905, '10............	73.30
Morehouse...	2	All in Morehouse.............	Pur. 1907 & 1905, '10............	100.70
Arietta......	3	....	1881, '85, '90 and purchase 1898...	174
do	4	....	Purchase 1898....	174
do	5	....	Purchase 1898....	174
do	6	....	Purchase 1898....	174
do	7	....	1877, '81, '85, '90..	174
do	18	....	Purchase 1898....	160
do	19	....	Purchase 1898....	160
do	20	....	Purchase 1898....	160
do	21	....	Purchase 1898....	160
do	22	....	Purchase 1898....	160
do	23	All in Arietta................	Purchase 1898....	153.70
Morehouse...	23	All in Morehouse.............	Purchase 1898....	6.30
Arietta......	24	All in Arietta................	Purchase 1898....	21.40
Morehouse...	24	All in Morehouse.............	Purchase 1898....	138.60
do ...	25	All in Morehouse.............	Purchase 1898....	43
Arietta......	25	All in Arietta................	Purchase 1898....	117
do	26	....	Purchase 1898....	160
do	27	....	Purchase 1898....	160
do	28	....	Purchase 1898....	160
do	29	....	Purchase 1898....	160
do	38	....	1877, '81, '85, '90..	200
do	39	....	1877, '80, '85, '90..	200
do	44	....	Purchase 1898....	200
do	45	....	Purchase 1898....	200
do	46	....	Purchase 1898....	200
do	47	....	Purchase 1898....	200
do	48	....	Purchase 1898....	200

HAMILTON COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		MOOSE RIVER TRACT, TOWNSHIP 9 — (*Continued*)		
Arietta	49		Purchase 1898	200
do	50		Purchase 1898	200
do	51		Purchase 1898	200
do	52		Purchase 1898	200
do	53		Purchase 1898	200
do	68		Pur. 1898 & 1900	200
do	69		Pur. 1898 & 1900	200
do	70		Purchase 1898	200
do	71		Purchase 1898	200
do	72		1877, '81, '85, '90, 95	200
do	73		Purchase 1898	200
do	74		Purchase 1898	200
do	75		Purchase 1898	200
do	76		Purchase 1892	200
do	77		Purchase 1892	200
do	78		Purchase 1892	200
do	79		Purchase 1892	200
do	80		Purchase 1898	200
do	81		Purchase 1898	200
do	82		Purchase 1898	200
do	83		Purchase 1898	200
do	84		Purchase 1898	210
do	85		Purchase 1898	210
do	86		Purchase 1898	200
do	87		Purchase 1898	200
do	88		Purchase 1898	200
do	89		Purchase 1898	200
do	90		Purchase 1892	200
do	91		Purchase 1892	200
do	92		Purchase 1892	200
do	93		Purchase 1892	200
do	94		Purchase 1892	200
do	95		Purchase 1892	200
do	96		Purchase 1892	200
do	97		Purchase 1892	200
do	98		Purchase 1892	200
do	99		Purchase 1892	200
do	100		Purchase 1892	200
do	101		Purchase 1892	200
do	102		Purchase 1892	200
do	103		Purchase 1892	200

HAMILTON COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		MOOSE RIVER TRACT, TOWNSHIP 9 — (*Continued*)		
Arietta	104		Purchase & 1900	200
do	105		Purchase 1898	200
do	106		Purchase & 1900	200
do	107		Purchase & 1900	200
do	108	All in Arietta	Purchase & 1900	133.30
Lake Pleasant	108	All in Lake Pleasant	Purchase 1898	76.70
do	109	All in Lake Pleasant	Purchase 1898	200.30
Arietta	109	All in Arietta	Purchase 1898	9.30
do	110	All in Arietta	Purchase 1898	168
Lake Pleasant	110	All in Lake Pleasant	Purchase 1898	32
Arietta	111		Pur. 1891 & 1895	200
do	112		Pur. 1891 & 1895	200
do	113		Pur. 1901 & 1900, '05	200
do	114		Pur. 1891 & 1895	200
do	115		Purchase 1892	200
do	116		Purchase 1897	200
do	117		Purchase 1897	200
do	118		Appropriated 1918 and 1877, '81, '85	200
do	119		Pur. 1898 & 1900	200
do	120		Pur. 1901 & 1900, '05	244
do	121		Purchase 1908	120.78
do	122		Purchase 1908	382.42
do	123		Purchase 1908	200
do	124		Purchase 1892	200
do	125		1885, '90, '00	200
do	126		Pur. 1891 & 1895	200
do	127		Pur. 1891 & 1895	200
do	128		Pur. 1891 & 1900	200
do	129	All in Arietta	Pur. 1891 & 1895	196
Lake Pleasant	129	All in Lake Pleasant	Pur. 1891 & 1900	4
do	131		Purchase 1898	210
do	132		1890, '95	210
do	133		1890, '95	200
Arietta	134	All in Arietta	1890, '95, '00	93.75
Lake Pleasant	134	All in Lake Pleasant	1885, '90, '00	112.25
Arietta	135		1885, '90, '00	200
do	136		Purchased 1891	200
do	137		1885, '90, '00	200
do	140	Triangle N. W. cor	1890	2

HAMILTON COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		MOOSE RIVER TRACT, TOWNSHIP 9 — (*Continued*).		
Arietta	144		1881, '85, '90, '95 Purchase 1891	270
do	145		1885, '90, '95, '00	200
do	146	All in Arietta	Purchase 1897	145
Lake Pleasant	146	All in Lake Pleasant	Purchase 1897	55
do	147	All in Lake Pleasant	1885, '95, '00	200
do	148		1885, '90, '00	200
do	149	S. E. cor. of E. ½	1881, '85, '90, '95	75
do	149	Ex. 75a. S. E. cor	Purchase 1891 & 1898	135
do	150	N. E. ½, N. W. ¼ & 20a. S. W. cor.	Purchase 1898 & 1901 & 1881, '85, '90	172.50
do	151		Purchase 1891	200
do	152		Pur. 1891 & 1897 & 1895	220
do	153		Pur. 1891 and 1897 & 1895	278.72
do	154	All in Lake Pleasant of 100a. E. pt	Purchase 1897	22
Arietta	154	All in Arietta of 100a. E. pt	Purchase 1897	78
Lake Pleasant	156		Pur. 1891 & 1895	200
do	160		Purchase 1908	137.29
		Total, Township 9, 22,141.31 acres.		
		MOOSE RIVER TRACT, TOWNSHIP 10,		
Arietta	...	All in Arietta	Purchase 1898	2,827.35
Morehouse	...	All in Morehouse	Purchase 1898	7,420.85
		Total 10,248.20a.		
		OXBOW TRACT.		
Wells	...	Albany Corporation Lot	Purchase 1897	350
do	1		Pur. 1892 & 1890, '95	932
Lake Pleasant	2		Purchase 1897	318
do	3		1890, '95	219
do	4		1890, '95	149
do	5		1890, '95	247
do	6		1885, '90	345
do	7		1885, '90	441
do	8		1890, '95	320

HAMILTON COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		OXBOW TRACT — (*Continued*)		
Lake Pleasant	9		Purchase 1897	320
Wells	10		1877, '81, '85	646
Lake Pleasant	12		Purchase 1897	320
do	13		1881, '85, '90	320
do	14		1885, '90	320
do	15		1885, '90	320
do	16		1885, '90, '95	320
do	17		1890, '95	320
do	18		1877, '81, '85, '90, '95, '00	373
do	19		1871, '77, '81, '85	274
do	23	E. ½	1890, '95	160
do	24		1890, '95, '00	320
do	25		1890, '95, '00	320
do	26		1885, '90, '95, '00	320
do	27		1890, '95	320
do	28		1843, '00*	320
do	29		1890, '95	320
do	30		Purchase 1897	320
Wells	31	All in Wells	Purchase 1897	195
do	32	All in Wells	1881, '85, '90	17
Lake Pleasant	32	All in Lake Pleasant	Appropriated 1919	65
Wells	33		Pur. 1900 & 1905	166
do	34		1877, '81, '85	271
do	35		1843, '00*	310
do	36	All in Wells	1885, '90	307
do	37	All in Wells	1843, '00*	248
Arietta	37	All in Arietta	1843, '00*	62
do	38	All in Arietta	Purchase 1897	140
Wells	38	All in Wells	Purchase 1897	170
do	39	All in Wells	Purchase 1898	33.65
Benson	39	All in Benson	Purchase 1898	41.85
Arietta	39	All in Arietta	Purchase 1891,1898 & 1895	234.50
do	40	All in Arietta	1881, '90, '95	309
do	41		1881, '85, '90	309.84
do	42		1877, '81	309
do	43		1881, '85, '90	155
do	44		Purchase 1898 & 1881, '90	155
do	45		1843, '00*	155

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* Resale, 1899.

HAMILTON COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		OXBOW TRACT — (*Continued*)		
Arietta	46		1885, '90	155
do	47		1890, '95	155
do	48		Purchase 1897	155
do	49	All in Arietta	Pur. 1891 & 1895	127
Wells	49	All in Wells	Purchase 1906	28
do	50	All in Wells	1881, '85, '90	120
Arietta	50	All in Arietta	1881, '85, '90	34
Wells	51		1877, '81, '85	155
do	52	All in Wells	1881, '85, '90	96
Lake Pleasant	53		1881, '85	155
do	54		1890, '95	153
do	55		Purchase 1897	66
do	56		1890, '95	136
do	57		1890, '95	155
do	58		1890, '95	155
do	59		Purchase 1897	155
Arietta	60	All in Arietta	1890, '95	19
Lake Pleasant	60	All in Lake Pleasant	Purchase 1908	120
Wells	60	All in Wells	1890, '95	15
Arietta	61	All in Arietta	1877, '81, '85	97
Wells	61	All in Wells	1877, '81, '85	58
Arietta	62	All in Arietta	1890, '95, '00	154
do	63		1890, '95, '00	155
do	64		1877, '81, '85, '90	155
do	65		1890, '95, '00	155
do	66		1885, '90	155
do	67		1890, '95	155
do	68		1881, '85, '90, '95	155
do	69		1885, '90	155
do	70		Purchase 1897	155
do	71		1890, '95	155
do	72		Purchase 1897	155
do	73		1885, '90	155
do	74		1885, '90	155
do	75		1877, '81, '85	155
do	76		1881, '85, '90	155
do	77		Purchase 1899	155
do	78		1885, '90, '95	155
do	79	All in Arietta	1890, '95	154
do	80	All in Arietta	Purchase 1897	91
Lake Pleasant	80	All in Lake Pleasant	Purchase 1897	64
do	81	All in Lake Pleasant	1890, '95	147.50
Arietta	81	All in Arietta	1890, '95	7.50

HAMILTON COUNaY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		OXBOW TRACT — (*Continued*)		
Lake Pleasant	82		1890, '95	155
do	83		1843, '00 & resale 1899	155
do	84		Purchase 1891 & 1890, '95	208
do	85		Purchase 1897	125
do	86		Purchase 1898	196.50
do	87		Purchase 1897	155
do	88		Purchase 1897	155
do	89	All in Lake Pleasant	Purchase 1897	146
Arietta	89	All in Arietta	Purchase 1897	9
Lake Pleasant	90	All in Lake Pleasant	Purchase 1897	87
Arietta	90	All in Arietta	Purchase 1897	68
Lake Pleasant	91	All in Lake Pleasant	Purchase 1897	17.50
Arietta	91	All in Arietta	Purchase 1897	137.50
do	92		Purchase 1897	155
do	93		Purchase 1897	155
do	94		Purchase 1897	155
do	95		Purchase 1897	155
do	96		Purchase 1897	155
do	97		Purchase 1897	155
do	98		1890, '95	155
do	99		1885, '90	155
do	100		Purchase 1897	155
do	101		Purchase 1897	155
do	102		Purchase 1897	155
do	103		Purchase 1897	155
do	104		1885, '90	155
do	105		Purchase 1897	155
do	106		1890, '95	155
do	107		1890, '95, '00	155
do	108		Purchase 1898	155
do	109		Purchase 1898	155
do	110		1881, '85, '90	155
do	111		1881, '85, '90	155
do	112		Purchase 1898	155
do	113		Purchase 1898	155
do	114		Purchase 1898	155
do	115		Purchase 1898	155
do	116	All in Arietta	Purchase 1897	141.50
Lake Pleasant	116	All in Lake Pleasant	Purchase 1897	13.50
do	117	All in Lake Pleasant	Purchase 1897	93
Arietta	117	All in Arietta	Purchase 1897	62

HAMILTON COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		OXBOW TRACT — (*Continued*)		
Arietta	118	All in Arietta	Purchase 1897	2
Lake Pleasant	118	All in Lake Pleasant	Purchase 1897	153
do	121	N. part	Purchase 1897	109
Arietta	121	All in Arietta	Purchase 1897	50
do	125		Purchase 1898	155
do	126		Pur. 1899 & 1900	155
do	127		Pur. 1908 & 1910	153
do	128		1881, '85, '90, '00	155
do	129		1881, '85, '90	155
do	130		1881, '85, '90	155
do	131		1881, '85, '90, '95	155
do	133		Purchase 1898	155
do	134		Purchase 1898	155
do	135		Purchase 1897	155
do	136		Purchase 1897	155
do	137		Purchase 1897	155
do	138		Purchase 1897	155
do	139		Purchase 1897	155
do	140		1890, '95, '00	155
do	141		Purchase 1897	155
do	142		Purchase 1897	155
do	143		1890, '95, '00	155
do	144		1881, '85, '90	155
do	145		Purchase 1899	155
do	146	Ex. water	1877, '81, '85, '90	154
do	148	All N. of Spy Lake ex. 100a. W. part	Purchase 1897	55
do	149		Purchase 1898	155
do	150		Purchase 1897	155
do	152		1848, '00*	155
do	153		1877, '81, '85, '90	155
do	154		Purchase 1897	155
do	156		Original & 1900*	155
do	157	Triangle E. end across 15.50 ch. on S. lot line (Tannery property)	1905, 1910	31.77
do	159		Purchase 1897	131
do	167		Purchase 1897	155
do	168		Purchase 1897	155
do	169		Purchase 1897	155
do	170		Purchase 1897	155

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* Resale, 1899.

HAMILTON COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		OXBOW TRACT — (*Continued*)		
Arietta......	171	....	Pur. 1891 & 1895..	155
do	172	....	Pur. 1891 & 1900..	155
do	173	....	Purchase 1897....	155
do	174	....	Pur. 1891 & 1895..	155
do	175	....	Purchase 1897....	155
do	176	....	Purchase 1897....	155
do	177	....	Purchase 1898....	155
do	183	....	Purchase 1897....	155
do	184	....	Purchase 1897....	155
do	185	....	Purchase 1897....	155
do	186	....	Purchase 1897....	155
do	187	....	Purchase 1897....	155
do	188	....	Purchase 1897....	155
do	189	....	Purchase 1897....	155
do	190	....	Purchase 1897....	155
do	191	....	1881, '85, '90.....	155
do	196	....	Purchase 1897....	155
do	197	....	Pur. 1891 & 1895..	155
do	198	....	Pur. 1891 & 1895..	155
do	199	....	Purchase 1897....	155
do	200	....	Purchase 1897....	155
do	201	....	Purchase 1897....	155
do	203	....	Purchase 1897....	155
do	204	....	Purchase 1918....	154.92
do	213	....	Purchase 1897....	155
do	216	....	Pur. 1891 & 1895..	155
do	217	....	Purchase 1897....	155
do	218	....	1871, '77, '81 , '85.	155
do	219	....	Pur. 1891 & 1895..	379
do	220	Ex. 13a. N. E. cor. E. of highway	Purchase 1897....	806
do	221	Ex. 20a. S. E. cor. E. of highway	Purchase 1897....	582
do	222	N. Part.....................	Purchase 1897....	340
do	223	W. pt 37½c. wide..............	Purchase 1908....	274.68
do	225	....	1890, '95.........	375
do	226	....	Pur. 1891 & 1895..	633
do	227	....	Pur. 1891 & 1895..	640
do	228	....	1877, '81, '85.....	434
do	231	N. end......................	Pur. 1899 & 1900..	300
do	232	....	Pur. 1891 & 1895..	500
do	235	....	Purchase 1897....	209
do	236	....	Purchase 1897....	209
do	238	....	Purchase 1897....	209
do	241	....	Purchase 1897....	148

HAMILTON COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		OXBOW TRACT — (*Continued*)		
Arietta	242		1890, '95	167
do	243		Purchase 1898	182
do	244		Purchase 1897	123
do	245		1881, '85, '90	154
do	246	Ex. 50a., W. Part	Purchase 1897	101
do	247		Purchase 1897	131
do	248		1881, '85, '95	137
do	252		1877, '81, '85, '90	178
do	253		1877, '81, '85, '90	178
do	254		Purchase 1897	178
do	255		Purchase 1897	235
do	256		Purchase 1897	418
do	257		Purchase 1897	225
do	258		Purchase 1897	225
do	259		1877, '81, '85, '90	225
do	263		Purchase 1897	225
do	264		Purchase 1897	225
do	265		Purchase 1897	225
do	266		Purchase 1897	356
do	267		Purchase 1897	351
do	268		Purchase 1897	179
do	269		1881, '85, '90, '95	179
do	272		Purchase 1897	179
do	273		Purchase 1897	248.40
do	274		Purchase 1897	248.40
do	275		Purchase 1897	248.40
do	276		Pur. 1891 & 1895	248.40
do	277		Pur. 1891 & 1895	248.40
do	278		Pur. 1891 & 1895	248.40
do	279	Ex. 62a. N. W. side	Purchase 1918	300.50
do	280		Purchase 1918	217.47
do	281		Purchase 1918	236.44
do	282		Purchase 1918	236.44
do	283		Purchase 1897	236
do	284		Purchase 1897	236
do	285		Purchase 1897	236
do	286		Purchase 1897	236
do	287		Purchase 1897	236
do	288		1885, '90	233
do	289		1885, '90	233
do	290		Purchase 1897	233
do	291		Purchase 1897	233
do	292		1881, '85, '90	233

HAMILTON COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		OXBOW TRACT — (*Continued*)		
Arietta	293		1871, '77, '81, '85	233
do	294		Purchase 1897	233
do	295		Pur. 1891 & 1900, & 1900, '05	320
do	296		Pur. 1900 & 1900, '05	200
do	297		Pur. 1900 & 1905	239
do	298		Pur. 1900 & 1905	239
do	299		Pur. 1900 & 1905	233
do	300		Purchase 1897	233
do	301		Purchase 1897	233
do	302		Purchase 1897	233
do	303		Purchase 1897	233
		Total Oxbow Tract, 51,902.96 acres.		
		PALMER'S PURCHASE, GENERAL ALLOTMENT.		
Wells	1	Sub. 2	1881, '85, '90, '95	100
do	1	Sub. 5	1854, Co. Tr.	100
do	1	Sub. 6	1854, Co. Tr.	100
do	2	Sub. 3, E. end	Purchase 1906	40
do	2	Sub. 5	1890	100
do	2	Sub. 6	Pur. 1906 & 1905, '10	100
do	3	Sub. 5	1877, '81, '85	100
do	3	Sub. 6	1877, '81, '85, '95	100
do	3	Sub. 7	Pur. 1906 & 1905, '10	100
do	4	Sub. 6, ex. land N. of outlet of Willis Lake	Pur. 1908 & 1910	92
do	4	Sub. 7	Pur. 1908 & 1910	100
do	4	Sub. 8	1877, '81, '90	100
do	4	Sub. 9	1877, '81, '85	100
do	4	Sub. 10	1877, '81, '85	100
Hope	5	All in Hope	1885, '90	93.75
Wells	5	All in Wells, ex. Subs. 8 & 9	1881, '85, '90 and Conveyed 1917	762
do	5	Sub. 8	Pur. 1908 & 1910	100
do	6	All in Wells	1877, '85	203
Hope	6	All in Hope	Pur. 1901 & 1900, '05	853
do	7		Purchase, 1901	1,050

HAMILTON COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		PALMERS PURCHASE, GENERAL ALLOTMENT — (*Continued*)		
Wells	8	Sub. 1	1881, '85, '90	100
do	8	Sub. 2, ex. S. E. ¼	1885, '90	75
do	8	Sub. 3	1881, '85, '90	100
do	8	Sub. 4	1885, '90, '95, '00	100
do	8	Sub. 5	1885, '90, '95, '00	100
do	8	Sub. 6	1885, '90, '95, '00	100
do	8	Sub. 7	1885, '90, '95, '00	100
do	8	Sub. 8	1885, '90, '95, '00	100
do	8	Sub. 9	1885, '90, '95, '00	100
do	8	Sub. 10	1885, '90, '95, '00	100
do	9		1881, '85, '90	1,049.75
do	10		1890, '95	1,049.75
do	11	All in Wells	1890, '95	1,019.75
do	12	All in Wells	1890, '95	700
do	13	All in Wells	1885, '90	400
Wells	14	All in Wells	1885, '90	150
do	15	All in Wells	1877, '81, '85, '90	983
do	16	Sub. 1	1895, '00	131
do	16	Sub. 2	1895, '00	52
do	16	Sub. 3	1895, '00	131
do	16	Sub. 4	1895, '00	52
do	16	Sub. 5	1895, '00	131
do	16	Sub. 6	1895, '00	52
do	16	Sub. 7, all in Wells	1895, '00	109
do	16	Sub. 8, same	1895, '00	22
do	16	Sub. 9, same	1895, '00	19
do	17	All in Wells	1895, '00	450
do	18	All in Wells	1885, '90, '95	249
do	19	A.. in Wells	1881, '85, '90	50
Hope	H. T. P. or 23	All N. of E. Stony Creek ex. parcel S. E. cor.	Pur. 1897 & 1901	607
do	H. T. P.	B'd by land of P. Remsen, E. by a 1,464 a. piece and W. by Bergen's Purchase	Purchase 1906	100
do	24	Sub. 1	1848	200
do	24	Sub. 2, E. ½	Purchase 1901	128.50
do	24	Sub. 5; All ex. parcel S. E. cor	Purchase 1901	206
do	25	Sub. 2	Purchase 1897	200
do	25	Sub. 3	Purchase 1897	200

HAMILTON COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		PALMER'S PURCHASE, GENERAL ALLOTMENT — *Continued*		
Hope........	25	Sub. 5........................	Purchase 1897....	258
do	26	All in Hamilton Co............	Purchase 1897....	752.40
do	27	All in Hamilton Co............	Purchase 1897....	428.17
		MIDDLE DIVISION.		
Hope........	...	Remsen Lot b'd E. by H. T. P. lot and W. by Bergen's Purchase, ex. 1½a. S. end.........	Pur. 1897 & 1895, 1900...........	998.50
		PALMER'S PURCHASE, REAR DIVISION, LEFFERTS' TRACT, NORTH HALF, RANGE 1.		
Wells........	6	Ex. 25a. E'ly end.............	1877, '81.........	75
do	7	....	Purchase 1901....	100
do	9	S. W. ½.......................	1877, '81.........	50
do	10	S. W. ⅓.......................	1877, '81.........	36
		RANGE 2.		
do	6	....	1871, '77, '81.....	100
do	7	E. end........................	Purchase 1901....	50
do	8	....	Purchase 1901....	100
do	9	....	1877, '81.........	100
do	10	....	1871, '77, '81.....	54
		RANGE 3.		
do	2	....	1895, '05 & conveyed 1909.....	100
do	3	....	1877, '81.........	100
do	4	....	1877, '81.........	100
do	6	....	1877, '81.........	100
do	7	....	1881, '90.........	100
do	8	....	1881, '85, '90, '00..	100
do	9	....	1877, '81, '85, '90..	100
do	10	....	1877, '81, '85, '90..	54
		RANGE 4.		
do	1	....	Conveyed 1908 & purchased 1898..	100
do	2	....	1890, '95.........	100
do	3	....	1877.............	100
do	4	....	1877, '00.........	100

HAMILTON COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		PALMER'S PURCHASE, REAR DIVISION, LEFFERT'S TRACT, NORTH HALF, RANGE 4 — (*Cont.*)		
Wells	6		1871, '77, 81, '00	100
do	7		1877, '81, '00	100
do	8		1877, '81, '85, '00	100
do	9		1877, '81, '85, '00	100
do	10		1877, '81, '85	54
		SOUTH ½.		
do	...	A. C. Worth lot	Purchase 1899	84.00
do	...	E. E. Platt lot	Purchase 1899	34.75
do	...	E. O. Abbott lot	Purchase 1897	50.00
		Total, Palmer's Purchase, 18,689.32 acres.		
		TOTTEN & CROSSFIELD PURCHASE, TOWNSHIP 1. NORTH ½.		
Lake Pleasant	1		1890, '95	170
do	2		1890, '95	170
do	3		1885, '90, '95	250
do	4		1877, '81, '85	250
do	5		1877, '81, '85	250
do	6		1877, '81, '85	250
do	7		Pur. 1906 & 1905, '10	250
do	12		Purchase 1897	250
do	13		1885, '90, '95	250
do	14		1885, '90, '95	250
do	15		1890, '95	250
do	25		Purchase 1897	250
do	26		Purchase 1897	250
do	27		Purchase 1897	250
do	29	Ex. 18a. N. W. cor. 6c., 921., E. & W. and 26c. N. & S.	Purchase 1898	172.50
do	30,31	Ex. 100 a., Meyrowitz lot	Purchase 1897	232.25
do	32		Purchase 1897	102
do	33		Purchase 1897	110
do	34		Purchase 1897	144
do	35		Purchase 1897	192
do	36	Ex. 10a. N. W. end	Purchase 1897	164
do	41	Ex. 100a. S. end	Purchase 1897	344

HAMILTON COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		TOTTEN & CROSSFIELD PURCHASE, TOWNSHIP 1 — (*Continued*) COURTNEY 500 ACRE TRACT		
Lake Pleasant	...	N. E. cor. b'd S. by highway....	Conveyed 1891....	87
do	...	B'd N. by highway, E. by J. Courtney, S. by Eliza Lewis..	Conveyed 1891....	25
do	...	B'd N. by highway, E. by W. C. Gallup and W. by H. E. Courtney........................	Conveyed 1891....	85
do	...	W. side b'd E. by Greenman....	Conveyed 1891....	50
		SOUTH HALF, GOSPEL, SCHOOL AND LITERATURE LOTS,		
Wells........	1	....	Pur. 1891 & 1895..	100
do	2	....	Purchase 1908....	100
do	3	....	Purchase 1891....	100
do	4	....	Pur. 1891 & 1895..	100.
do	5	....	Pur. 1891 & 1895..	100
do	6	....	Purchase 1908....	100
do	7	....	Purchase 1908....	100
do	8	....	Purchase 1908....	100
do	9	....	Purchase 1891....	100
do	10	....	Purchase 1891....	100
do	11	....	Purchase 1891....	120
do	12	....	Purchase 1891....	120
		SOUTH EAST ¼		
do	...	S. E. cor. square...............	1877.............	200
		VAN WAGONER TRACT, ALLOTMENT 2, (*Butler Map*)		
do	13	....	Purchase 1897....	145
do	14	....	Pur. 1897 & 1900..	441
		ALLOTMENT 3,		
do	7	....	1881, '90.........	68
do	8	....	1885, '90.........	60
do	9	....	1881, '85, '90......	104

HAMILTON COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		TOWNSHIP 1, S. HALF, VAN WAGONER TRACT — (*Continued*) ALLOTMENT 4,		
Wells........	3	....	1877, '81, '85......	210
do	4	....	1877, '81, '85.....	210
		SOUTH WEST ¼,		
do	1	....	1881, '95.........	200
do	2	....	1881, '95.........	214.46
do	3	....	Pur. 1900 & 1900, '05............	193
do	4	....	Pur. 1900 & 1900, '05............	204
do	5	....	Pur. 1900 & 1900, '05............	285
do	6	....	Pur. 1900 & 1900, '05............	326
do	7	Ex. 50a. S. end across..........	Pur. 1900 & 1900, '05............	170
do	8	....	Pur. 1900 & 1900, '05............	222
do	9	....	Pur. 1900 & 1900, '05............	271
do	10	....	Pur. 1900 & 1900, '05............	310
do	11	....	Pur. 1900 & 1900, '05............	310
do	12	....	Pur. 1900 & 1900, '05............	285
do	13	....	Pur. 1900 & 1900, '05............	106
do	14	....	Purchase 1897.....	280
do	15	....	Purchase 1897.....	236
do	16	....	1890, '95.........	236
do	17	....	1890, '95.........	280
do	18	....	Pur. 1900 & 1900, '05............	227
do	19	....	Pur. 1900 & 1900, '05............	279
do	20	....	Pur. 1900 & 1900, '05............	329
		Total, Township 1, T. & C. P., 12,689.21 acres.		

HAMILTON COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		TOTTEN & CROSSFIELD PURCHASE — (*Continued*) TOWNSHIP 2, (*Jones' Map*)		
Lake Pleasant	7	Ex. 66a. covered by water and 130a. S. pt. of rem.	Pur. 1901 & 1900, '05	73
do	15		Pur. 1901 & 1900, '05	269
Lake Pleasant	16	Ex. 50a. Pine Point on Sacandaga Lake	1901 & 1895, '00, '05	488
do	17			
do	18	Ex. 21a. S. E. cor. on Echo Lake and 52a. on E. line adj. Echo Lake beg. 24c. from S. E. cor. of lot, 26c. long N'ly & S'ly & 20c. wide E'ly & W'ly	Pur. 1901 & 1900, '05	195
do	19	N. end 144a. & S. E. cor. 20a.	1877, '81, '90, '95	164
do	20	E. side	1877, '90	160
do	21	W. pt. 240a. & N. pt. of rem. 28c., 57l., long N. & S.	1877, '81, '85, '90	252
do	22		1877, '90, '95	151
do	23		1877, '81, '85, '90	269
do	24		Pur. 1901 & 1877, '81	269
do	25		Pur. 1901 & 1877, '81, '85, '90	269
do	26	Ex. 1½a. on Indian Bay Point (W. W. Wiles) & ex. island in Sacandaga Lake (L. F. Fish)	Pur. 1901 & 1900, '05	266
do	27		Pur. 1901 & 1900, '05	269
do	28		Pur. 1901 & 1900, '05	269
do	29		Pur. 1899 & 1877, '81, '85, '90, '95.	269
do	31	Ex. 9a. in S. E. part (B. Page)	Pur. 1901 & 1900, '05	260
do	32		Pur. 1901 & 1881, '85, '90, '00, '05.	269
do	33		1877, '81, '85, '90	137
do	34		Purchase 1897	269
do	35	All not under water	1885, '90, '95, '00	217

HAMILTON COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		TOTTEN & CROSSFIELD PURCHASE, TOWNSHIP 2 (*Jones' Map*) — (*Continued*).		
Lake Pleasant	36		Pur. 1907 & 1905, '10	269
do	37		Pur. 1901 & 1900, '05	269
do	38		Pur. 1901 & 1900, '05	269
do	39		Pur. 1901 & 1900, '05	269
do	40		1877, '81, '85, '90	269
do	41		Pur. 1901 & 1900, '05	269
do	42		Pur. 1907 & 1900, '05	269
do	43	Ex. 20a. N. W. cor. & 4a. S. E. cor	1890, '95	245
do	44		1877, '81, '85, '90	124.40
do	45		1885, '90, '95, '00	269
do	46		1877, '81, '85, '90	269
do	47		Pur. 1900 & 1900	269
do	48		1890, '95	269
do	51		1877, '81, '85, '90, '95	269
do	53		1877, '81, '85, '90, '95	269
do	55		1877, '81, '85, '90	108
do	56		Purchase 1906	269
do	57		Purchase 1897	269
do	58		1885, '90, '95	269
do	62		1885, '90	269
do	63		1885, '90	269
do	64		1890, '95	269
do	66		1877, '81, '85, '90	93.60
Arietta	67	All in Arietta	Purchase 1897	19.50
Lake Pleasant	67	All in Lake Pleasant	Purchase 1897	249.50
do	68		Purchase 1897	269
do	69		1890, '95	269
do	70		1890, '95	269
do	71		Purchase 1897	269
do	72		1890, '95	269
do	73		1890, '95	269
do	74		1890, '95	269

HAMILTON COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		TOTTEN & CROSSFIELD PURCHASE, TOWNSHIP 2 (*Jones' Map*) — (*Continued*).		
Lake Pleasant	75		1885, '90, '95	269
do	76		1885, '90	269
do	77		1877, '81, '85, '90	80
do	79	All in Lake Pleasant	Purcahse 1897	250
Arietta	79	All in Arietta	Purchase 1897	19
Lake Pleasant	81		1890, '95	269
do	84		1885, '90, '95	181
do	85		1871, '77, '81, '85, '95	181
do	86		1871, '77, '81, '85, '95	181
do	87		1885, '90	181
do	88		1885, '90	48
		Total, Township 2, 14,546 acres.		
		TOTTEN & CROSSFIELD PURCHASE, TOWNSHIP 3,		
Arietta	1	N. E. ¼	1881, '85	37.50
do	3	All in Arietta	1877, '81, '85, '90	105.20
Lake Pleasant	4		1871, '77, '81, '85, '90, '95	96.36
do	6		1877, '81, '85, '90, '95	89.94
do	7		1877, '81, '85, '90, '90, '95	87.25
do	8		1890, '95	85.56
do	9		1885, '90, '95	87.17
do	10		1871, '77, '81, '85, '95	87.85
do	11		1877, '85, '90, '05	90.64
do	12		1871, '77, '81, '85, '90, '95	150
do	13		1890, '95	150
do	14		1890, '95	150
do	15		1890, '95	150
do	16		1890, '95	150
do	17		1890, '95	150
do	18		1871, '77, '81, '85, '90	150

HAMILTON COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		TOTTEN & CROSSFIELD PURCHASE, TOWNSHIP 3 — (*Continued*).		
Arietta	20		1877, '81, '85, '90	150
do	21	Ex. 37½a. N. W. ¼, & 25a. E. end of S. ½ across	1877, '81, '85	87.50
do	22		1877, '85, '90	150
do	24		1877, '81, '85, '90, '95	150
do	25		1877, '85, '90	150
Lake Pleasant	27	All in Lake Pleasant	1881, '85, '90, '95, & conveyed 1897	144
do	28		1871, '77, '81, '85, '90, '95	150
do	29		1871, '77, '81, '85, '90, '95	150
do	30		1871, '77, '81, '85, '90, '95	150
do	31		1871, '77, '81, '85, '90, '95	150
do	32		1871, '77, '81, '85, '90, '95	150
do	33		1871, '77, '81, '85, '90, '95	150
do	34		1871, '77, '81, '85, '90, '95	150
do	35		1871, '77, '81, '85, '90, '95	150
do	36		1877, '81, '90, '95, '00	150
do	37		1877, '81, '90, '95, '00	150
do	38		1877, '81, '90, '95, '00	150
do	39		1877, '81, '90, '95, '00	150
Arietta	40	All in Arietta	1881, '85, '95, '00	70
Lake Pleasant	40	All in Lake Pleasant	1881, '85, '90, '95, '00	80
Arietta	41		1877, '81, '85, '95, '05	150
do	43	Ex. 30a. N. W. cor. square	1881, '85, '90	120
do	46	S. W. ¼	1881, '85	37.50
do	47		1877, '81, '85, '90	150

HAMILTON COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		TOTTEN & CROSSFIELD PURCHASE, TOWNSHIP 3 — (*Continued*)		
Arietta	48		1881, '85, '90 & purchase 1897	150
do	49	All in Arietta of S. E. ¼	Purchase 1897	30.50
Lake Pleasant	49	All in L. Pleasant of S. E. ¼	Purchase 1897	7
do	51		1877, '81, '85, '90, '95, '00	150
do	52	N. ½	1877, '81, '85, '90	75
do	53	N. ½ and S. W. ¼	1877, '81, '85, '90	112.50
do	54		1871, '77, '81, '85, '90, '95	150
do	55	S. W. ¼	1881, '85, '90	37.50
do	58		1871, '77, '81, '85, '90, '95	150
do	59	S. ½ and N. W. ¼	1877, '81, '85, '90 '90, '95	112.50
do	60		1877, '81, '85, '90, '95	150
Arietta	63		1877, '81, '85, '90, '95	150
do	64		1877, '81, '85, '90, '95	150
do	65		1877, '81, '85, '90, '95	150
do	66		1877, '85, '90, '95	150
do	67	S. ½ and N. E. ¼	1871, '77, '81, '85, '90, '95	112.50
do	68	S. W. ¼	1871, '77, '90	37.50
do	69	S. ½ and N. W. ¼	1871, '77, '81, '85, '90	112.50
do	70		1871, '77, '81, '85, '90	150
do	71		1871, '77, '81, '85, '90	150
do	72		1871, '77, '81, '85, '90	150
do	73	N. W. pt. in Arietta	1871, '77	46
Lake Pleasant	73	N'ly end of 75a. E. pt., in Lake Pleasant	1871, '90	50
do	74		1871, '77, '81, '85, '90, '95	150
do	75	N. ½ and S. E. ¼	1871, '77, '81, '85, '90, '95	112.50

HAMILTON COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		TOTTEN & CROSSFIELD PURCHASE, TOWNSHIP 3 — (*Continued*)		
Lake Pleasant	76	....	1871, '77, '81, '85, '90, '95.........	150
do	77	....	1871, '77, '81, '85, '90, '95.........	150
do	78	....	1871, '77, '81, '85, '90, '95.........	150
do	79	....	1871, '77, '81, '85, '90, '95.........	150
do	80	....	1871, '77, '81, '85, '90, '95.........	150
do	81	N. end of 130a. E. pt..........	1871, '90, '95.....	20
do	82	S. end of all in Lake Pleasant of 25a. S. E. cor of lot..........	1871.............	10
Arietta......	82	N. W. cor., square.............	1871.............	5
do	83	....	1871, '77, '81, '85, '90............	150
do	84	....	1871, '77, '81, '85, '90, '95.........	150
do	85	S. ½ and N. E. ¼...............	1871, '77, '81, '85, '90............	112.50
do	86	Ex. 127a. N. W. pt............	1871, '81, '85, '90..	23
do	88	....	1871, '77, '81, '85, '90, '95.........	150
do	89	N. ½ and S. W. ¼..............	1871, '77, '81, '85, '90, '95.........	112.50
do	90	....	1871, '77, '81, '85, '90, '95.........	150
do	91	S. ½ and N. W. ¼..............	1871, '77, '81, '85, '90, '95.........	112.50
do	92	N. W. cor., square.............	1871, '85, '90.....	5
do	93	....	1871, '77, '81, '85, '90, '95.........	150
do	94	....	1871, '77, '81, '85, '90............	150
do	95	N. ½ and S. W. ¼..............	1871, '77, '81, '85, '90, '95.........	112.50
do	96	S'ly end of 75a. W. pt. in Arietta	1871.............	3
Lake Pleasant	96	All in Lake Pleasant..........	1871, '77, '81, '85..	70
do	97	....	1871, '77, '81, '85, '90, '95.........	150
do	98	....	1871, '77, '81, '85, '90, '95.........	150

HAMILTON COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		TOTTEN & CROSSFIELD PURCHASE, TOWNSHIP 3 — (*Continued*)		
Lake Pleasant	99	....	1871, '77, '81, '85, '90, '95.........	150
do	100	....	1871, '77, '81, '85 & conveyed 1899	150
do	101	....	1871, '77, '81, '85 & conveyed 1899	150
do	102	All in Lake Pleasant...........	1877, '81, '85, & conveyed 1899..	122
Arietta......	102	All in Arietta.................	1877, '81, '85 & conveyed 1899..	28
do	103	All in Arietta.................	1871, '77 & conveyed 1899.....	147
Lake Pleasant	103	All in Lake Pleasant...........	1871, '77 & conveyed 1899.....	3
Arietta......	104	....	1871, '81, '85 & conveyed 1899..	150
do	105	....	1871, '81, '85, & conveyed 1899..	150
do	106	....	1871, '81, '85 & conveyed 1899..	150
do	107	....	1871, '77, '81, '85 & conveyed 1899	150
do	108	....	Conveyed 1899....	150
do	109	....	1871, '77, '81 & conveyed 1899..	150
do	110	....	1871, '81, '85 & conveyed 1899..	150
do	111	....	1871, '81, '85 & conveyed 1899..	150
do	112	....	1871, '81, '85 & conveyed 1899..	150
do	113	....	1871, '81, '85 & conveyed 1899..	150
do	114	....	1871, '85, & conveyed 1899.....	150
do	115	....	1871, '85 & conveyed 1899.....	150
do	116	....	1871, '81, '85 & conveyed 1899..	150
do	117	....	1871, '81, '85 & conveyed 1899..	150

HAMILTON COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		TOTTEN & CROSSFIELD PURCHASE, TOWNSHIP 3 — (*Continued*)		
Arietta......	118	....	1871, '81, '85 & conveyed 1899..	150
do	119	All in Arietta.................	Conveyed 1899....	120
Lake Pleasant	119	All in Lake Pleasant...........	Conveyed 1899....	30
Arietta......	120	All in Arietta.................	1871, '77 & conveyed 1899.....	2
Lake Pleasant	120	All in Lake Pleasant...........	1871, '77, & conveyed 1899.....	148
do	121	....	1877, '81, '85 & conveyed 1899..	150
do	122	....	1877, '81, '85 & conveyed 1899..	150
do	123	All in Lake Pleasant...........	1871, '81 & conveyed 1899.....	84
Arietta......	123	All in Arietta.................	1871, '81 & conveyed 1899.....	66
do	124	....	1871, '85 & conveyed 1899.....	150
do	125	....	1871, '81, '85 & conveyed 1899..	150
do	126	....	1871, '85 & conveyed 1899.....	150
do	127	....	1871, '85 & conveyed 1899.....	150
do	128	....	Conveyed 1899....	150
do	129	....	1871 & conveyed 1899...........	150
do	130	....	1871, '85 & conveyed 1899.....	150
do	131	....	1871, '81, 85 & conveyed 1899..	150
do	132	....	1871, '77, '81, '85 & conveyed 1899	150
do	133	....	1871, '81, '85, & conveyed 1899..	300
do	134	....	1871, '85 & conveyed 1899.....	300
do	135	....	1871, '77, '85 & conveyed 1899..	300
do	136	....	1871, '85, & conveyed 1899.....	300

HAMILTON COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		TOTTEN & CROSSFIELD PURCHASE TOWNSHIP 3 — (*Continued*)		
Arietta	137		1871, '85 & conveyed 1899	300
do	138		1871, '85, & conveyed 1899	300
do	139		1871, '77, '85 & conveyed 1899	300
do	140		1871, '77, '85 & conveyed 1899	300
do	141		1871, '77, '85 & conveyed 1899	300
Lake Pleasant	142	All in Lake Pleasant	Conveyed 1899	8.50
Arietta	142	All in Arietta	1871, '77 & conveyed 1899	291.50
do	143	All in Arietta	1871, '77 & conveyed 1899	100
Lake Pleasant	143	All in Lake Pleasant	1871, '77, '85, & conveyed 1899	200
		Total, Township 3, T. & C. P., 18,788.47 acres.		
		TOTTEN & CROSSFIELD PURCHASE, TOWNSHIP 4,		
Arietta	56		Pur. 1898 & 1900	157.66
do	57		Pur. 1898 & 1900	157.66
do	67	All in Arietta	Pur. 1898 & 1900	7.19
do	68	All in Arietta	Pur. 1898 & 1900	128.96
do	69		Pur. 1898 & 1900	157.66
do	70		Pur. 1898 & 1900	157.66
do	71		Pur. 1898 & 1900	157.66
do	72		Pur. 1898 & 1900	157.66
do	73		Pur. 1898 & 1900	157.66
do	74		Pur. 1898 & 1900	157.66
do	75		Pur. 1898 & 1900	157.66
do	76		Pur. 1898 & 1900	157.66
do	77		Pur. 1898 & 1900	157.66
do	78		Pur. 1898 & 1900	157.66
do	79		Pur. 1898 & 1900	157.66
do	80		Pur. 1898 & 1900	157.66
do	81		Pur. 1898 & 1900	157.66
do	82		Pur. 1898 & 1900	157.66
do	83	Ex. 9.76a. N. W. cor	Pur. 1898 & 1900	147.90
do	84	Ex. 46.32a. N. part	Pur. 1894 & 1900	111.34

HAMILTON COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		TOTTEN & CROSSFIELD PURCHASE, TOWNSHIP 4 — (*Continued*)		
Arietta......	85	Ex. 46.32a. N. part............	Pur. 1898 & 1900..	111.34
do	86	Ex. 46.32a. N. part............	Pur. 1898 & 1900..	111.34
do	87	All in Arietta..................	Pur. 1898 & 1900..	33.60
do	94	Ex. 13.19a. W. side............	Pur. 1898 & 1900..	124.47
do	95	....	Pur. 1898 & 1900..	157.66
do	96	....	Pur. 1898 & 1900..	157.66
do	97	....	Pur. 1898 & 1900..	157.66
do	98	....	Pur. 1898 & 1900..	157.66
do	99	....	Pur. 1898 & 1900..	157.66
		Total, Twp. 4, T. & C. P., 4,087 acres.		
		TOTTEN & CROSSFIELD PURCHASE, TOWNSHIP 5,		
do	...	All in Arietta, 7,400a. ex. 175a. being all of Lot 4, Nivens' Tract, in Arietta; 150a. of F. P. Garvin and 1550½a. of a J. P. Morgan.................	1885 & '90 & purchase 1899......	5,523.50
Inlet........	...	All in Inlet, $15,909\frac{1}{10}$a. ex. $922\frac{98}{100}$ in lot 4, Nivens' Tract	1881, '85, '90, '00 & purchase 1899	14,986.12
		Total, Township 5, T. & C. P. 20,509.62 acres.		
		TOTTEN & CROSSFIELD PURCHASE, TOWNSHIP 6,		
Arietta and Lake Pleasant	...	All ex. the "carry" lot, 200a.; F. P. Garvin land, 880a.; Vanderbilt land, 1,526a. and Huntington 139a............	Purchase and appropriated 1897.	23,872
		TOTTEN & CROSSFIELD PURCHASE, TOWNSHIP 7,		
Lake Pleasant	...	Gospel and School lot in N. E. ¼.	1885, '90.........	320
do	...	S. E. ¼, ex. S'ly pt. thereof, 87c., 52l. wide N. & S............	Pur. 1894 & 1900..	4,199.50
do	...	All of S. W. ¼ in Lake Pleasant 6,176.05a. ex. 658.8a. being all in Lake Pleasant of 750a. N'ly part of S. W. ¼ 31c., 25l. wide N. & S.....................	Pur. 1894 & 1900..	5,517.25

HAMILTON COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		TOTTEN & CROSSFIELD PURCHASE, TOWNSHIP 7 — (*Continued*)		
Arietta	...	All of S. W. ¼ in Arietta, 123.95a. ex. 91.20a. being all thereof contained in 750a. N'ly part of S. W. ¼, 31c., 25l. wide N. & S.	Pur. 1894 & 1900	32.75
		Total, Township 7, 10,069½ acres.		
		TOTTEN & CROSSFIELD PURCHASE, TOWNSHIP 8, *North ½*,		
Lake Pleasant	...	Gospel and School lot	Purchase 1899	640
do	1		Purchase 1899	262.50
do	2		Purchase 1899	262.50
do	3		Purchase 1899	262.50
do	4		Purchase 1899	262.50
do	5		1881, '85, '90	262.50
do	6		1881, '85, '90	262.50
do	7		1881, '85, '95 and purchase 1899	262.50
do	8		Purchase 1899	262.50
do	9		Pur. 1899 & 1905	262.50
do	10		Purchase 1899	262.50
do	11		Pur. 1899 & 1905	262.50
do	12		Pur. 1899 & 1905	262.50
do	13		1877, '81, '85, '90, '95 & pur. 1899	262.50
do	14		1877, '81, '85, 90, '95 & pur. 1899	262.50
do	15		1877, '81, '85, '90, '95 & pur. 1890	262.50
do	16		1877, '81, '85, '90, '95 & pur. 1899	262.50
do	17		1877, '81, '85, '90, '95 & pur. 1899	262.50
do	18		1877, '81, '85, '90, '95 & pur. 1899	262.50
do	19		1877, '81, '90, '95, '00 and pur. 1899	262.50
do	20		Purchase 1899	262.50
do	21		1877, '81, '85	262.50
do	22		1877, '81, '85, '90, '95	262.50

HAMILTON COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		TOTTEN & CROSSFIELD PURCHASE, TOWNSHIP 8, *North* ½ — (*Continued*)		
Lake Pleasant	23	....	Purchase 1899....	262.50
do	24	....	Purchase 1899....	262.50
do	25	....	Pur. 1898 & 1900..	262.50
do	26	....	Purchase 1899....	262.50
do	27	....	1877, '81, 85, '95, '00............	262.50
do	28	....	1885, '90, '95, '00 & purchase 1899	262.50
do	29	....	1877, '81, '85.....	262.50
do	30	....	1877, '81, '85, '90, '95...........	262.50
do	31	....	1877, '81, '85.....	262.50
do	32	....	1877, '81, '85.....	262.50
do	33	....	Purchase 1899....	262 [illegible]
do	34	....	Purchase 1899....	262 [illegible]
do	35	Ex. 2 parcels 6.89a. on lake.....	Purchase 1899....	255.61
do	36	Ex. 16.07a. on lake...........	Purchase 1899....	246.43
do	37	....	Purchase 1899....	262.50
do	38	....	Purchase 1899....	262.50
do	39	....	Pur. 1899 & 1871, '77, '85, '90, 95.	262.50
do	40	....	1877, '81, '85......	262.50
do	41	....	1877, '81, '85.....	243.32
do	42	....	Purchase 1899....	243.32
do	43	....	Purchase 1899....	243.36
do	44	....	1877, '81, '85, '90, '00............	243.36
do	45	....	Purchase 1899....	243.32
do	46	....	Purchase 1898....	243.32
		Soouth East ¼,		
do		Literature lot ex. 17.10a. on Lake (E. Galusha)................	Purchase 1899.....	302.90
do ..	1	Great lot (Coddington) ex. Literature lot and ex. 180a. on Lake (E. Galusha)...............	Purchase 1899....	500
do	2	....	1881, '85, '90......	125
do	3	....	1881, '85, '90......	125
do ..	5	....	1877,'81,'85,'95,'00.	125
do	6	....	1881, '85, '90......	125
do	7	....	1881, '85, '90......	125

HAMILTON COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		TOTTEN & CROSSFIELD PURCHASE, TOWNSHIP 8, *South East* ¼—(*Continued*)		
Lake Pleasant	8		Pur. 1898 & 1900	125
do	9		Pur. 1898 & 1900	125
do	10		1877,'81,'85,'95,'00	125
do	11		1877,'81,'85,'95,'00	125
do	12		1877,'81,'85,'95,'00	125
do	13		1877,'81,'85,'95,'00	125
do	14		1877, '81, '85, '90	125
do	15		1877, '81, '85, '90	125
do	16		1877, '81, '85, '90	125
do	17		1877, '81, '85, '90	125
do	18		1877,'81,'85,'95,'00	125
do	19		1877,'81,'85,'95,'00	125
do	20		1877,'81,'85,'90,'95	125
do	21		1877,'81,'85,'90,'95	125
do	22		1877, '81, '85	125
do	23		1877, '81, '85, '90	125
do	24		1877, '81, '85, '90	125
do	25		1877, '81, '85, '90	125
do	26		Purchase 1899	125
do	27		Purchase 1899	125
do	28		Purchase 1899	125
do	29	" East "	1871,'77,'81,'85,'95	125
do	29	" West "	1871,'77,'81,'85,'95	125
do	30		1871, '77, '81, '85	125
do	31		1871, '77, '81	125
do	32		1871, '77, '81	125
do	33		1871,'77,'81,'85,'95	125
do	34		1871,'77,'81,'85,'95	125
do	35		1871,'77,'81,'85,'95,	125
do	36		1871,'77,'81,'85,'95	125
do	37		1871,'77,'81,'85,'95	125
do	38		1871,'77,'81,'85,'95	125
do	39		1871,'77,'81,'85,'95	125
do	40	All in Lake Pleasant	1871,'77,'81,'95,'00	75
Wells	40	All in Wells	1871, '77, '81, '95	50
		So. West ¼		
Lake Pleasant		Literature lot	Purchase 1899	320
do		All after ex. Literature lot	1877,'81,'85,'90,'95	6,000
		Total, Township 8, T. & C. P., 24,573.94 acres.		

HAMILTON COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		TOTTEN & CROSSFIELD PURCHASE, — (*Continued*) TOWNSHIP 9		
Lake Pleasant	.....	Parcel W. side of Elm lake.....	1877, '81, '85, '90..	60
		Elm Lake Road Tract		
do	6	....	1853.............	50
do	8	....	1853.............	50
do	10	....	1853.............	50
do	14	....	1853.............	50
do	22	....	1853.............	50
		Total, Township 9, T. & C. P., 310 acres.		
		TOTTEN & CROSSFIELD PURCHASE, TOWNSHIP 10		
Wells........	.....	N. E. corner, unallotted, 6,905a. ex. 1a. S. W. cor. and ex. 191a. S. side b'd S. by lot 13 and parts of 12 and 14...........	Purchase 1892....	6,713
		TOTTEN & CROSSFIELD PURCHASE, TOWNSHIPS 10 AND 29		
Lake Pleasant	1	All in Lake Pleasant ex. 80a. b'd N. by Gilman Lake, S. by town line and W. by Twp. line (C. Fisher and others)...........	Purchase 1898....	737
Wells........	1	All in Wells..................	Purchase 1898....	250
Lake Pleasant and Wells..	2	....	Purchase 1898, appropriated 1919 & 1885, '90, '05..	1,045.38
Wells........	3	Sub. 1......................	1895, '00.........	108.80
do	3	Sub. 2......................	Pur. 1891 & 1895..	108.80
do	3	Sub. 3......................	Pur. 1891 & 1895..	108.80
do	3	Sub. 4......................	Pur. 1891 & 1895..	108.80
do	3	Sub. 5......................	Pur. 1891 & 1895..	108.80
do	3	Sub. 6......................	Pur. 1891 & 1895..	108.80
do	3	Sub. 7......................	Pur. 1891 & 1895..	108.80
do	3	Sub. 8......................	Pur. 1891 & 1895..	108.80
Lake Pleasant	3	Sub. 9, All in Lake Pleasant....	1890, 1895........	2
Wells........	3	Sub. 9, All in Wells...........	1890, '00.........	106.80
do	3	Sub. 10, All in Wells...........	1890, '00.........	88.65
Lake Pleasant	3	Sub. 10, All in Lake Pleasant....	1890, 1895........	20.15
Wells........	4	S. end......................	1877, '81, '85.......	300

HAMILTON COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		TOTTEN & CROSSFIELD PURCHASE, TOWNSHIPS 10 & 29 — (*Continued*)		
Wells	6	Ex. 200a. N. end & 290a. S. end	1877, '81, '85, '90, '95	549.20
do	7	Ex. 290a. S. end	1890, '95	738.25
do	10	Ex. 450a. N'ly end	1881, '85, '90	593
do	11	Ex. 100a. N. end	1877, '81, '85	716
do	12	All S. of Sacandaga river ex. 50a. N. W. cor. 12.50 ch. E. & W.	Purchase 1897	609
do	13	Ex. $222\frac{78}{100}$a. N. pt	Purchase 1896	633.72
do	14	Ex. $239\frac{90}{100}$a. N. pt	Purchase 1896	624.60
do	15	All in Hamilton Co., 831.88a. ex. $222\frac{74}{100}$a. N. pt. thereof	Purchase 1896	609.14
do	16	All in Ham. Co., ex. so much sold in 1883, by McEchron and others to Drake and to Hayes.	Purchase 1896, '97.	397.37
do	17	All in Hamilton Co	Purchase 1896	37.78
		Total, Townships 10 & 29, 8,928.44 acres.		
		TOTTEN & CROSSFIELD PURCHASE, TOWNSHIP 14, N. ½ & S. E. ¼, (POND'S SURVEY)		
Indian Lake	9	All in Hamilton county	1877, '81, '85, '90	68
do	10	S. ½ all in Hamilton county	1877, '81, '90	35
do	11	All in Hamilton county	1877, '81, '85	130
do	12	All in Hamilton county	1877, '81, '85	18
do	13	All in Hamilton county	Pur. 1895 & 1900	215
do	14		1871, '77, '81	160
do	16	All in Hamilton county	Conveyed 1905 & 1905 & '10	155
do	33		1877, '81, '85	160
do	34	W. ½	1877, '81, '85	80
do	35		Purchase 1895	160
do	36		Purchase 1895 & 1900	240
do	37		1885, '90	240
do	38		1877, '81, '85, '90	160
do	39		1885, '90	160
do	40		1877, '81, '85	160
do	42	All in Hamilton county	1877, '81, '85, '90	81
do	56		1890	160
do	57	E. ½	1877, '81, '85	80
do	58		1877, '81, '85	160

HAMILTON COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		TOTTEN & CROSSFIELD PURCHASE, TOWNSHIP 14, N. ½ & S. E. ¼, (POND'S SURVEY)— (*Continued*)		
Indian Lake..	59	....	1877, '81, '85......	160
do ..	60	....	1885, 1890.........	240
do ..	61	....	1885, 1890.........	240
do ..	75	Ex. 22.06a. N. E. cor...........	1877, 1885.........	137.94
do ..	77	....	1881, 1885.........	160
do ..	79	S. ½.........................	1890..............	120
do ..	81	....	1881, 1885.........	160
do ..	82	....	1877, '81, '85......	160
do ..	86	All in Hamilton county.........	1877, '85, '90......	127
do ..	87	....	1881, '85..........	160
do ..	88	....	1881. '85..........	160
do ..	89	....	Pur. 1893 & 1900..	160
do ..	90	....	Pur. 1893 & 1900..	240
do ..	91	....	Pur. 1893 & 1900..	240
do ..	92	....	Pur. 1893 & 1900..	160
do ..	93	....	1881, '85..........	160
do ..	94	....	1885, '90..........	160
do ..	99	All in Hamilton county.........	1885, '90..........	116
do ..	100	....	1881, '85..........	160
do ..	101	....	1881, '85..........	160
do ..	104	....	1881, '85..........	132
do ..	106	All in Hamilton county.........	1885, '90, '95......	29
		Total, T'wp. 14, 6,163.94acres.		
		TOTTEN & CROSSFIELD PURCHASE, TOWNSHIP 15		
do ...	1	....	Purchase 1897 & 1890, '95, '00....	140.90
do ...	2	....	Purchase 1897 & 1890, '95, '00....	140.00
do ...	3	....	Purchase 1897 & 1890, '95, '00....	129.10
do ...	4	....	1890, '95, & purchase 1897......	135.10
do ...	6	....	1890, '95 & purchase 1897......	161.20
do ..	14	....	1890, '95, '00 & purchase 1897...	122.60
do ..	15	....	1890, '95, '00 & purchase 1897...	164.00

HAMILTON COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		TOTTEN & CROSSFIELD PURCHASE, TOWNSHIP 15 — *(Continued)*		
Indian Lake..	16	All W. of river...............	1890, '95 & purchase 1897......	51.50
do ..	19	All N. of S. shore of Indian River.....................	Pur. 1897 & 1890..	6.00
do ..	21	Ex. 1a. W. pt. (B. Lamphere), 520a. S. E. pt. (Root) & ex. 1½a. W. pt. (S. Lamphere)....	Purchase 1897 & 1895, 1900......	158.37
do ..	24	N. end across.................	Pur. 1897 & 1890..	41.20
do ..	25	....	Pur. 1897 & 1890, '95, '00.........	160.50
do ..	28	....	Pur. 1897 & 1890..	158.80
do ..	29	Ex. 2a. N. W. cor............	1890, '95, '00 & purchase 1897...	173.90
do ..	33	W'ly ½.....................	Purchase 1897....	81.30
do ..	35	....	Pur. 1897 & 1895, '00............	161.60
do ..	37	E. ½.......................	Pur. 1897 & 1895, '00............	65.30
do ..	38	....	Pur. 1897 & 1895, '00............	160.60
do ..	39	....	Pur. 1897 & 1890, '95, '00.........	164.10
do ..	40	....	Pur. 1897 & 1890..	162.50
do ..	43	....	Purchase 1897 and 1917...........	159.20
do ..	48	....	Pur. 1897 & 1890, '95, '00.........	164.00
do ..	49	....	Pur. 1897 & 1890, '95, '00.........	163.50
do ..	50	....	Pur. 1897 & 1890, '95, '00.........	160.00
do ..	51	....	Pur. 1897 & 1890, '95, '00.........	160.00
do ..	52	....	Pur. 1897 & 1890, '95, '00.........	185.90
do ..	53	All S. of Parker Brook.........	Purchase 1897....	60.00
do ..	54	....	Pur. 1897 & 1890, '95, '00.........	160.00
do ..	55	S. part......................	Purchase 1897....	102.10
do ..	56	All E. of Centre Brook.........	Purchase 1897....	12.70

HAMILTON COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		TOTTEN & CROSSFIELD PURCHASE, TOWNSHIP 15 — (*Continued*)		
Indian Lake..	57	W'ly part..................	Purchase 1897....	75.50
do ..	59	....	1890, '95, '00 & purchase 1897...	157.30
do ..	60	....	1890, '95, '00 & purchase 1897...	128.60
do ..	61	....	Purchase 1897....	126.00
do ..	62	....	1890, '95, '00 & purchase 1897...	161.90
do ..	63	W'ly part..................	1890, '95 & purchase 1897......	24.30
do ..	67	....	Pur. 1897 & 1890, '95, '00.........	162.00
do ..	68	....	Pur. 1897 & 1890, '95, '00.........	160.00
do ..	69	....	Pur. 1897 & 1890, '95, '00.........	160.00
do ..	70	....	Pur. 1897 & 1890, '95, '00.........	160.00
do ..	71	....	Pur. 1897 & 1890, '95, '00.........	160.00
do ..	74	....	Pur. 1897 & 1890, '95, '00.........	160.00
do ..	75	....	Pur. 1897 & 1890, '95, '00.........	160.00
do ..	76	....	Pur. 1897 & 1890, '95, '00.........	160.00
do ..	77	....	Pur. 1897 & 1890, '95, '00.........	160.00
do ..	78	....	Pur. 1897 & 1890, '95, '00.........	160.00
do ..	79	79 N. E. pt. 8½ ch. wide........	Purchase 1897 & 1890, '95, '00....	35.50
do ..	84	....	1890, '95, '00 & purchase 1897...	128.10
do ..	85	....	1890, '95, '00 & purchase 1897...	125.30
do ..	88	....	Purchase 1897....	165.50
do ..	89	....	Purchase 1897....	160.00
do ..	90	....	Pur. 1897 & 1890, '95, '00.........	160.00
do ..	91	....	Pur. 1897 & 1890, '95, '00.........	160.00

HAMILTON COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		TOTTEN & CROSSFIELD PURCHASE, TOWNSHIP 15 — (*Continued*)		
Indian Lake..	92	....	Pur. 1897 & 1890, '95, '00.........	160.00
do ..	93	....	Pur. 1897 & 1890, '95, '00.........	160.00
do ..	94	....	Pur. 1897 & 1890, '95, '00.........	160.00
do ..	95	....	Pur. 1897 & 1890, '95, '00.........	160.00
do ..	96	E. side.......................	Pur. 1897 & 1890..	30.00
do ..	97	....	Pur. 1897 & 1890, '95, '00.........	162.00
do ..	98	....	Pur. 1897 & 1890, '95, '00.........	160.00
do ..	99	....	Pur. 1897 & 1890, '95, '00.........	160.00
do ..	100	....	Pur. 1897 & 1890, '95, '00.........	160.00
do ..	101	....	Pur. 1897 & 1890, '95, '00.........	160.00
do ..	102	....	Pur. 1897 & 1890, '95, '00.........	160.00
do ..	103	All in Ham. Co...............	Purchase 1897....	60.00
do ..	104	All in Ham. Co...............	Purchase 1897....	120.00
do ..	105	....	Purchase 1897....	158.00
do ..	107	S. E'ly part..................	1890, '95 & purchase 1897......	67.90
do ..	108	....	Pur. 1897 & 1890..	126.60
do ..	110	....	1890, '95, '00 & purchase 1897...	160.00
do ..	111	....	1890, '95 & purchase 1897......	160.00
do ..	112	....	Purchase 1897 and 1917...........	160.20
do ..	113	All in Hamilton Co............	Pur. 1897 & 1890..	35.00
do ..	115	All in Ham. Co...............	Purchase 1897....	40.00
do ..	116	All in Ham. Co...............	Purchase 1897....	120.00
do ..	117	....	Pur. 1897 & 1890, '95, '00.........	160.00
do ..	118	....	Pur. 1897 & 1890, '95, '00.........	160.00

HAMILTON COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		TOTTEN & CROSSFIELD PURCHASE, TOWNSHIP 15 — (*Continued*)		
Indian Lake..	119	....	Pur. 1897 & 1890, '95, '00.........	160.00
do ..	120	....	Purchase 1897....	160.00
do ..	121	....	Pur. 1897 & 1890, '95............	160.00
do ..	122	....	Pur. 1897 & 1890, '95, '00.........	160.00
do ..	123	All in Ham. Co...............	Pur. 1897 & 1890, '95, '00.........	130.00
do ..	124	All in Ham. Co...............	Purchase 1897....	40.00
do ..	129	All in Hamilton Co............	1890, '95, '00 & purchase 1897...	80.00
do ..	130	....	1890, '95, '00 & purchase 1897...	160.00
do ..	131	....	1890, '95 & purchase 1897......	160.00
do ..	133	All S. of Carroll brook.........	1890, '95, '00 & purchase 1897...	26.60
do ..	134	....	1890, '95, '00 & purchase 1897...	160.00
do ..	135	All in Hamilton Co............	1890, '95, '00 & purchase 1897...	150.00
do ..	136	All in Hamilton Co............	Purchase 1897....	10.00
do ..	143	All in Ham. Co...............	Purchase 1897....	80.00
do ..	144	All in Ham. Co...............	Purchase 1897....	150.00
do ..	145	All in Ham. Co...............	Purchase 1897....	10.00
do ..	154	All in Ham. Co...............	1890, '95, '00 & purchase 1897...	80.00
do ..	155	....	1890, '95, '00 & purchase 1897...	220.00
do ..	156	....	1890, '95, '00 & purchase 1897...	120.30
		Total, Township 15, T. & C. P., 12,452.57 acres.......		
		TOTTEN & CROSSFIELD PURCHASE, TOWNSHIP 16,		
do ..	1	All in Ham. Co...............	1885, '90, '95.....	500
do ..	2	All in Ham. Co...............	1885, '90, '95.....	524
do ..	3	All in Ham. Co...............	1885, '90, '95.....	506
do ..	4	All in Ham. Co...............	1885, '90, '95.....	413

HAMILTON COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		TOTTEN & CROSSFIELD PURCHASE, TOWNSHIP 16 — (*Continued*)		
Indian Lake	5	All in Ham. Co	1885, '90, '95	312
do	6	All in Ham. Co	1885, '90, '95	296
do	7	All in Ham. Co	1885, '90, '95	199
do	8	All of 317a. S. part in Ham. Co.	1885, 1890	13
do	14		1877,'81,'85,'90,'95.	78
do	15		1877,'81,'85,'90,'95.	232
do	17	N. W. ¼ All in Ham. Co	1877,'81,'85,'90,'95.	77
do	20		1877,'81,'85,'90,'95.	1,000
do	21		Partition 1897, Pur. 1917 and 1881	1,009.10
do	22	Ex. 100a. S. end	1877, '81, '85, '90	900
do	23	Ex. 100a. S. end	1877, '81, '85, '90	900
do	24		1877, '81, '85, '95	1,000
		Total, Township 16, 7,959.10 acres.		
		TOTTEN & CROSSFIELD PURCHASE, TOWNSHIP 17,		
do		The Gospel and School lot	Pur. 1891 & 1890	640
do		Literature lot	Pur. 1891 & 1890	640
do	1		Purchase 1900	160
do	2		Purchase 1900	160
do	3		Purchase 1900	160
do	4		Purchase 1900	160
do	5		Purchase 1900	160
do	6		Purchase 1900	160
do	7		Purchase 1900	160
do	8		Purchase 1907	160
do	9		Purchase 1900	160
do	10		Purchase 1900	160
do	11		Purchase 1900	160
do	16		Purchase 1900	160
do	17		Purchase 1900	160
do	18		Purchase 1900	160
do	19		Purchase 1900	160
do	20		Purchase 1900	160
do	21		Purchase 1900	160
do	22		Purchase 1900	160
do	23		Purchase 1900	160
do	24		Purchase 1900	160
do	27		Purchase 1900	160

HAMILTON COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		TOTTEN & CROSSFIELD PURCHASE TOWNSHIP 17 — (*Continued*)		
Indian Lake	29		Purchase 1900	160
do	32		Purchase 1900	160
do	33		Purchase 1900	160
do	34		Purchase 1900	160
do	35		Purchase 1900	160
do	36		Purchase 1900	160
do	37		Purchase 1900	160
do	38		Purchase 1900	160
do	39		Purchase 1900	160
do	45		Purchase 1900	160
do	46		Purchase 1900	160
do	47		Purchase 1900	160
do	48		Purchase 1900	160
do	49		Purchase 1900	160
do	50		Purchase 1900	160
do	51		Purchase 1900	160
do	52		Purchase 1900	160
do	56	W. side S. of river	Purchase 1908	82.25
do	57		Purchase 1900	160
do	58		Purchase 1900	160
do	59		Purchase 1900	160
do	60		Purchase 1900	160
do	61		Purchase 1900	160
do	62		Purchase 1900	160
do	63		Purchase 1900	160
do	64		Purchase 1900	160
do	65		Purchase 1900	160
do	69	All N. of Cedar River	Purchase 1900	128
do	70	S. ½	Purchase 1900	80
do	74	N. ½	Purchase 1900	80
do	75		Purchase 1900	160
do	76		Purchase 1900	160
do	77		Purchase 1900	160
do	78		Purchase 1900	160
do	81		Purchase 1900	160
do	82		Purchase 1900	160
do	83	S. ½	Purchase 1900	80
do	87	N. ½	Purchase 1900	80
do	88		Purchase 1900	160
do	89		Purchase 1900	160
do	90		Purchase 1900	160

HAMILTON COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		TOTTEN & CROSSFIELD PURCHASE, TOWNSHIP 17 — (*Continued*)		
Indian Lake..	91	....	Purchase 1900....	160
do ..	94	....	Purchase 1900....	160
do ..	95	....	Purchase 1900....	160
do ..	96	....	Purchase 1900....	160
do ..	97	....	Purchase 1900....	160
do ..	98	....	Purchase 1900....	160
do ..	99	....	Purchase 1900....	160
do ..	100	....	Purchase 1900....	160
do ..	101	....	Purchase 1900....	160
do ..	102	....	Purchase 1900....	160
do ..	103	....	Purchase 1900....	160
do ..	104	....	Purchase 1900....	160
do ..	106	....	Purchase 1900....	160
do ..	107	....	Purchase 1900....	160
do ..	108	....	Purchase 1900....	160
do ..	109	....	Purchase 1900....	160
do ..	110	....	Purchase 1900....	160
do ..	111	....	Purchase 1900....	160
do ..	112	....	Purchase 1900....	160
do ..	113	....	Purchase 1900....	160
do ..	114	....	Purchase 1900....	160
do ..	115	....	Purchase 1900....	160
do ..	116	....	Purchase 1900....	160
do ..	117	....	Purchase 1900....	160
do ..	120	....	Purchase 1900....	160
do ..	121	....	Purchase 1900....	160
do ..	122	....	Purchase 1900....	160
do ..	123	....	Purchase 1900....	160
do ..	124	....	Purchase 1900....	160
do ..	125	....	Purchase 1900....	160
do ..	126	....	Purchase 1900....	160
do ..	127	....	Purchase 1900....	160
do ..	128	....	Purchase 1900....	160
do ..	129	....	Purchase 1900....	160
do ..	130	....	Purchase 1900....	160
do ..	131	....	1885, '90, '95.....	160
do ..	132	....	Pur. 1900 and 1885, '90, '95........	160
do ..	133	....	Pur. 1900 & 1885, '90, 95.........	160
do ..	134	....	Purchase 1900....	160

HAMILTON COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		TOTTEN & CROSSFIELD PURCHASE, TOWNSHIP 17 — (*Continued*)		
Indian Lake	135		Purchase 1900	160
do	136		Purchase 1900	160
do	137		Purchase 1900	160
do	138		Purchase 1900	160
do	139		Purchase 1900	160
do	140		Purchase 1900	160
do	141		Purchase 1900	160
do	142		Purchase 1900	160
do	143		Purchase 1900	160
do	144		1885, '90, '95	160
do	145		1885, '90, '95	160
do	146		Pur. 1900 & 1885, '90, '95	160
do	147		Pur. 1900 & 1885, '90, '95	160
do	148		Purchase 1900	160
do	149		Purchase 1900	160
do	150		Purchase 1900	160
do	151		Purchase 1900	160
do	152		Purchase 1900	160
do	153		Purchase 1900	160
do	154		Purchase 1900	160
do	155		Purchase 1900	160
do	156		Purchase 1900	160
		Total, Township 17, T. & C. P. 20,530.25 acres.		
		TOTTEN & CROSSFIELD PURCHASE, TOWNSHIP 19,		
do	...	Gospel and School lot	Purchase 1891	640
do	...	Literature lot	Purchase 1891	640
do	10	Ex. 3a. O'Neil dam lot	Pur. 1906, '08, & 1905	1,041.66
do	11	Ex. 7a. 34th dam lot	Pur. 1906, '08, & 1905	1,037.66
do	12		Pur. 1906, '08 & 1905	1,044.66
do	19		1881, '85, '90	730
do	20	W. part	1881, '85, '90	291
		Total, Township 19 T. & C. P., 5,424.98 acres.		

HAMILTON COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		TOTTEN & CROSSFIELD PURCHASE, —(*Continued*) TOWNSHIP 20, (*Pierson Survey*)		
Long Lake....	A	N. W. corner 1,231.11a. ex. 40a. sq. beg. 75 ch. S. .60 deg. W. from S. E. cor. of parcel......	Purchase 1891, conveyed in partition 1907 & 1910....	1,191.11
do ...	B	....	Purchase 1891....	1,050.00
		Total, Township 20, 2,241.11 acres.		
		TOTTEN & CROSSFIELD PURCHASE, TOWNSHIP 21,		
do	1	....	Con. 1900 & 1905..	200
do	1	....	Con. 1900 & 1905..	200
do	2	....	Con. 1900 & 1905..	200
do	3	....	Con. 1900 & 1905..	200
do	4	....	Con. 1900 & 1905..	200
do	5	....	Con. 1900 & 1905..	200
do	10	....	1877, '81, '85, '90, '95, & pur. 1899.	200
do	11	....	1877, '81, '85, '90, '95, & pur. 1899.	200
do	12	....	1877, '81, '85, '90 & purchase 1899.	200
do	13	....	Con. 1900 & 1905..	200
do	14	....	Con. 1900 & 1905..	200
do	15	....	Con. 1900 & 1905..	200
do	16	....	Con. 1900 & 1905..	200
do	17	....	Con. 1900 & 1905..	200
do	18	....	1877, '81, '85, '90 & purchase 1899.	200
do	21	....	1877,'81,'85......	200
do	22	....	1877,'81,'85......	200
do	23	....	1877,'81,'85......	200
do	24	....	1877,'81,'85......	200
do	25	....	Con. 1900 & 1905..	200
do	26	....	Con. 1900 & 1905..	200
do	27	....	Con. 1900 & 1905..	200
do	28	....	Con. 1900 & 1905..	200
do	29	....	Con. 1900 & 1905..	200
do	30	....	1877, '81, '85, '90 & purchase 1899..	200

HAMILTON COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		TOTTEN & CROSSFIELD PURCHASE, TOWNSHIP 21 — (*Continued*)		
Long Lake....	31	....	1877, '85, '90......	200
do	32	....	1877, '81, '85, '90 & purchase 1899 ..	200
do	33	....	1877, '81, '85, '90 & purchase 1899 ..	200
do	37	....	Con. 1900 & 1905..	200
do	38	....	Con. 1900 & 1905..	200
do	39	....	Con. 1900 & 1905..	200
do	40	....	Con. 1900 & 1905..	200
do	41	....	Con. 1900 & 1905..	200
do	42	....	1885, '90 & purchase 1899......	200
do	44	....	1881, '85, '90, '95..	200
do	45	....	Purchase 1898.....	200
do	46	....	1877, '81, '85 & purchase 1899...	200
do	47	....	1877, '81, '85, '90..	200
do	49	....	Con. 1900 & 1905..	200
do	50	....	Con. 1900 & 1905..	200
do	51	....	Con. 1900 & 1905..	200
do	52	....	Con. 1900 & 1905..	200
do	53	....	Con. 1900 & 1905..	200
do	54	....	1877, '81, '85, '90 & purchase 1899 ..	200
do	58	....	1877, '81, '85 & purchase 1899...	200
do	61	....	1877, '81, '85 & purchase 1899...	200
do	62	....	1877, '81, '85 & purchase 1899 ..	200
do	63	....	1877, '81, '85 & purchase 1899 ..	200
do	64	....	1877, '81, '85 & purchase 1899...	200
do	65	....	1877, '81, '85 & purchase 1899...	200
do	66	....	1877, '81, '85......	200
do	67	....	Purchase 1898....	200
do	73	....	1877, '81, '85 ...	200
do	74	....	1877, '81, '85 & purchase 1899..	200

HAMILTON COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		TOTTEN & CROSSFIELD PURCHASE, TOWNSHIP 21 — (*Continued*)		
Long Lake....	75	....	1877, '81, '85, '00 & purchase 1899....	200
do	76	All not under water............	1877, '81, '85......	175
do	77	....	1877, '81, '85 & purchase 1899...	133
do	83	....	1877, '81, '85......	200
do	85	....	1877, '81, '85......	200
do	86	All not under water............	1877, '81, '85......	150
do	90	....	1877, '81, '85 & purchase 1899...	200
do	91	....	1877, '81, '85 & purchase, 1899..	200
do	92	....	1877, '81, '85 & purchase 1899...	200
do	93	W. ½........................	Conveyed 1903....	100
do	96	....	1877, '81, '85 & purchase 1899...	200
do	101	....	1877, '81, '85, '90 & purchase 1899...	200
do	102	....	1877, '81, '85, '90 & purchase 1899...	200
do	103	....	1877, '81, '85, '90 & purchase 1899...	200
do	104	....	1877, '81, '85, '90 & purchase 1899...	200
do	105	....	1877, '81, '85, '90 & purchase 1899 ..	200
do	106	....	1877, '81, '85 & purchase 1899...	200
do	107	....	1877, '81, '85 & purchase 1899...	200
do	108	....	1877, '81, '85 & purchase 1899...	200
do	109	....	1877, '81, '85......	200
do	112	....	1877, '81, '85......	200
do	113	....	1877, '81, '85 & purchase 1899...	200
do	114	....	1877, '81, '85 & purchase 1899...	200
do	115	....	1877, '81, '85, '95..	200
do	116	....	1877, '81, '85 & purchase 1899...	200

HAMILTON COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		TOTTEN & CROSSFIELD PURCHASE, TOWNSHIP 21 — (*Continued*)		
Long Lake...	117	....	1877, '81, '85 & purchase 1899...	200
do ...	118	....	1877, '81, '85 & purchase 1899...	200
do ...	119	....	1877, '81, '85 & purchase 1899...	200
do ...	120	....	1877, '81, '85 & purchase 1899...	200
do ...	121	....	1877, '81, '85 & purchase 1899...	200
do ...	123	....	1881, '85, '90 & purchase 1899...	200
do ...	124	....	1877, '81, '85 & purchase 1899...	200
do ...	125	....	1877, '81, '85, & purchase 1899...	200
do ...	126	....	1877, '81, '85 & purchase 1899...	200
do ...	127	....	1877, '81, '85 & purchase 1899...	200
do ...	129	....	1877, '81, '85 & purchase 1899...	200
do ...	130	....	1877, '81, '85 & purchase 1899...	200
do ...	131	....	1877, '81, '85 & purchase 1899...	200
do ...	132	....	1877, '81, '85, & purchase 1899...	200
		Total, Township 21, T. & C. P., 18,158 acres.		
		TOTTEN & CROSSFIELD PURCHASE, TOWNSHIP 22, *South ½*,		
do ...	1	....	Purchase 1891....	176
do ...	2	....	Purchase 1891....	169
do ...	3	....	Purchase 1891....	170
do ...	4	....	Purchase 1891....	162
do ...	9	....	1881, '85, '90 & conveyed 1905...	158
do ...	10	....	Purchase 1891....	154

HAMILTON COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		TOTTEN & CROSSFIELD PURCHASE, TOWNSHIP 22, *South ½* —*Continued*)		
Long Lake	11		Purchase 1891	147.50
do	12		Purchase 1891	158
do	13		Purchase 1891	166.75
do	14		Purchase 1901	151.50
do	15		Purchase 1891	158
do	22		Purchase 1891	160
do	23		1877, '81, '85	155
do	24		Purchase 1900	167.50
do	25		Purchase 1900	172
do	48		Purchase 1900	163
do	49		Purchase 1900	161.40
do	59	All not covered by water	Purchase 1900	124
do	60		1877, '81, '85	160
do	61		1877, '81, '85	160
do	62	All not covered by water	Purchase 1900	106
do	63	N. end, S. pt. water	1877	30
		Total, Township 22, T. & C. P., 3,329.65 acres.		
		TOWNSHIP 23, AND TRIANGLE N.		
do	1		1871, '81, '85, '90	148
		TOTTEN & CROSSFIELD PURCHASE, TOWNSHIP 25, BAILEY'S PATENT		
Indian Lake	74	All in Hamilton Co	1871, '77, '81, '95	13
do	75	All in Hamilton Co	1871, '77, '81, '95	5
		Total Twp. 25, 18 acres.		
		TOTTEN & CROSSFIELD PURCHASE, TOWNSHIP 29,		
Wells		All in Hamilton Co. N. of lots 16 and 17	Purchase 1892	6,566
		TOTTEN & CROSSFIELD PURCHASE, TOWNSHIP 31,		
do		Gospel & School lot	Purchase 1897	640
do		Literature lot	Purchase 1897	640
do		Roosevelt Tract	1890, 1895	1,280
do		S. E. cor. sq. of 1920a. N. E. cor. of twp.	1890, 1895	640

HAMILTON COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		TOTTEN & CROSSFIELD PURCHASE, TOWNSHIP 31 — (*Continued*).		
Wells........	.....	Parcel b'd N. by lots 43 and 44, E. by lots 46, 51, & 57 Gorton Tract, S. by lot 57, Gorton, & lot 38, Range 1 & W. by G. S. & L. lots..............	Purchase 1897....	380
do	.....	Wells & Redfield Tract.........	Purchase 1897....	2,519.91
		Gorton Tract,		
do	1	....	Purchase 1897....	132
do	2	....	Purchase 1897....	132
do	3	....	Purchase 1897....	132
do	4	....	Purchase 1897....	132
do	5	....	Purchase 1897....	132
do	6	....	Purchase 1899....	132
do	7	....	Purchase 1897....	132
do	8	....	Purchase 1897....	132
do	9	....	Purchase 1897....	132
do	10	....	Purchase 1897....	132
do	11	....	Purchase 1897....	132
do	12	....	Purchase 1897....	132
do	13	....	Purchase 1897....	132
do	14	....	Purchase 1897....	132
do	15	....	Purchase 1897....	168
do	16	....	Purchase 1897....	121
do	17	....	Purchase 1897....	121
do	18	....	Purchase 1897....	131
do	19	....	Purchase 1897....	131
do	22	....	1885, '90, '95......	131
do	23	....	1885, '90, '95......	131
do	24	....	Purchase 1897....	121
do	25	....	Purchase 1897....	121
do	26	....	Purchase 1897....	131
do	27	....	Purchase 1897....	131
do	28	....	Purchase 1897....	131
do	29	....	Purchase 1897....	131
do	30	....	Purchase 1897....	131
do	31	....	Purchase 1897....	144
do	32	....	Purchase 1897....	121
do	33	....	Purchase 1897....	121
do	34	....	Purchase 1897....	131

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		TOTTEN & CROSSFIELD PURCHASE, TOWNSHIP 31, *Gorton Tract* — (*Continued*)		
Wells	35		Purchase 1897	131
do	36		Purchase 1897	131
do	37		Purchase 1897	131
do	38		Purchase 1897	131
do	39		Purchase 1897	131
do	40		Purchase 1897	173
do	41		Purchase 1897	165
do	42		Purchase 1897	165
do	43		Purchase 1897	156
do	44		Purchase 1897	136
do	45		Purchase 1897	128
do	46		Purchase 1897	120
do	47		Purchase 1897	120
do	48		1890, '95	120
do	49		1890, '95	120
do	50		1890, '95	109
do	51		1890, '95	117
do	52		1890, '95	117
do	53		1890, '95	117
do	54		1890, '95	117
do	55		1890, '95	117
do	56		1890, '95	115
do	57		1890, '95	146
do	58		1890, '95	113
do	59		1890, '9	113
do	60		1890, '95	113
do	61		1890, '95	112
do	62		1890, '95	163
do	63		1890, '95	163
do	64		1890, '95	163
do	65		1890, '95	178
do	66		1890, '95	163
do	67		1890, '95	163
do	68		1890, '95	114
do	69		1890, '95	123
do	70		1890, '95	93
		Ranges 1, 2, 3, 4, 5, 6 *and* 7,		
do	1		1890, '95	228
do	2		1890, '95	228

HAMILTON COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		TOTTEN & CROSSFIELD PURCHASE, TOWNSHIP 31, *Ranges* 1, 2, 3, 4, 5, 6 *and* 7 — (*Continued*)		
Wells	3		1890, '95	228
do	10		1890, '95	228
do	11		1890, '95	228
do	12		1890, '95	228
do	13		1890, '95	228
do	14		1890, '95	228
do	15		1890, '95	228
do	22		1890, '95	228
do	23		1890, '95	228
do	24		1890, '95	228
do	25		Purchase 1897	182
do	26		Purchase 1897	182
do	27		Purchase 1897	182
do	28		Purchase 1897	182
do	29		Purchase 1897	182
do	30		Purchase 1897	182
do	31		Purchase 1897	182
do	32		Purchase 1897	181
do	33		1890, '95	182
do	34		1890, '95	182
do	35		1890, '95	182
do	36		1890, '95	182
do	37		1890, '95	160
do	38		1890, '95	160
		Total, Twp. 31, T. & C. P., 20,321.91 acres.		
		TOTTEN & CROSSFIELD PURCHASE, TOWNSHIP 32,		
Indian Lake		Gospel and School lot	Purchase 1891	640
do		Literature lot	Purchase 1891	640
do		N. W. Cor. Sq	Purchase 1891	273
do		N. W. Cor. Sq. 1,100a. ex. 273a. N. W. cor. thereof	1877, '81, '85	827
do		S. ½ of 5,800a. sq. S. E. Cor. of Twp	1881, 1890 & partition conveyance 1898	1,933.33

HAMILTON COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		TOTTEN & CROSSFIELD PURCHASE TOWNSHIP 32, — (*Continued*)		
Indian Lake..	.....	N. ½ and S. W. ¼ ex. Literature lot; Gospel & School lot; 1,100a. sq. N. W. cor.; Lots 1, 2, 3, 4, 5, and 7, N. W. side of Indian Lake; 72.60a. parcel (Farrington); 38.70a. parcel and 30a. parcel (Haight) 50a. Camp Sabael; 6.30a. 5a. and 1a. parcels in Lot 6 (Best) 6.80a. parcel in Lot 6 (Welton and Morton) and 3,256a. in Lake........................	Purchase 1897....	13,371.90
		Total, Twp. 32, T. & C. P., 17,685.23 acres.		
		TOTTEN & CROSSFIELD PURCHASE, TOWNSHIP 33, EAST PART OF N. ½ ALLOTED,		
do ..	1	....	1877, '81, '85, '00, '05 & conveyed 1900*..........	160
do ..	2	....	1877, '81, '85, '00, '05 & conveyed 1900*..........	160
do ..	3	....	1877, '81, '85, '00, '05 & conveyed 1900*..........	160
do ..	4	....	1877, '81, '85, '00, '05 & conveyed 1900*..........	160
do ..	21	....	1877, '81, '85, '00, '05 & conveyed 1900*..........	160
do ..	22	....	1877, '81, '85, '00, '05 & conveyed 1900*..........	160
do ..	23	....	1877, '81, '85, '00, '05 & conveyed 1900*..........	160

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* Conveyed in partition.

HAMILTON COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		TOTTEN & CROSSFIELD PURCHASE, TOWNSHIP 33, EAST PART OF N. ½ ALLOTTED — (*Continued*)		
Indian Lake..	24	....	1877, ’81, ’85, ’00, ’05 & conveyed 1900*..........	160
do ..	25	....	1877, ’81, ’85, ’00, ’05 & conveyed 1900*..........	160
do ..	26	....	1877, ’81, ’85, ’00, ’05 & conveyed 1900*..........	160
do ..	27	....	1877, ’81, ’85, ’00, ’05 & conveyed 1900*..........	160
do ..	28	....	1881, ’85, ’00, ’05, & conveyed 1900	* 160
		Total, Township 33, 1,920 acres.		
		TOWNSHIP 34,		
do ..	.....	All unallotted portion ex. Moynehan lot of 160a.; wood lot 100a. and "Castle Rock" 10a..	Purchase 1906 & 1905, 1910......	20,893
do ..	2	S. end.......................	Purchase 1908 & ’10............	92
		Total, Twp. 34, T. & C. P., 20,985 acres.		
		TOTTEN & CROSSFIELD PURCHASE, TOWNSHIP 35,		
Long Lake...	.....	S. ½ of Twp. ex. 2a. at Buttermilk Falls......................	Purchase 1900....	12,598
		TOTTEN & CROSSFIELD PURCHASE, TOWNSHIP 38,		
do ...		N. E. cor. b'd S'ly by Tatum & Converse and Nehasene Park.	Purchase 1896 & 1900, 1905......	2,996

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* Conveyed in partition.

HAMILTON COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		TOTTEN & CROSSFIELD PURCHASE —(*Continued*) TOWNSHIP 40,		
Long Lake...	.....	All 25,625a. ex. 38.16a. Antlers; 72a. Schermerhorn; 38a. Thatcher; 57a. Platt; 345a. Carnegie; 273a. Pine Knot: 3.33a. Bluff Island; 3a. Pine Island; 11.87a. R. R. terminal; 78a. Golding and others; 27a. Cranberry Pond; 147a. Forked Lake and 5,075a. Raquette Lake......................	Purchase 1909, Partition 1884, T. S. 1871, '77, '81...	19,456.64
do ...	.....	Carnegie Lot (North Point)..... Total, 19,801.64 acres.	Purchase 1909....	345.00
		TOTTEN & CROSSFIELD PURCHASE, TOWNSHIP 41,		
do ...	...	All in Hamilton Co., E. of the "Koetteritz" or "Page" line ex. 75a., Cascade Lake lot....	Pur. 1897 & 1881, '95, '00.........	22,537.50
		TOTTEN & CROSSFIELD PURCHASE, TOWNSHIP 42,		
do ...	96	All in Long Lake..............	Purchase 1896.....	16.20
do ...	97	All in Long Lake..............	Purchase 1896....	178.12
do ...	98	....	Purchase 1896....	196.80
do ...	99	....	Purchase 1896....	196.80
do ...	100	....	Purchase 1896....	196.80
do ...	101	....	Purchase 1896....	196.80
do ...	102	....	Purchase 1896....	196.80
do ...	103	....	Purchase 1896.....	196.80
do ...	104	....	Purchase 1896.....	196.80
do ...	105	All in Long Lake..............	Purchase 1896.....	132.28
do ...	115	All in Long Lake..............	Purchase 1896....	63
do ...	116	....	Purchase 1896.....	196.80
do ...	117	....	Purchase 1896.....	196.80
do ...	118	....	Purchase 1896....	196.80

HAMILTON COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		TOTTEN & CROSSFIELD PURCHASE, TOWNSHIP 42—(*Continued*)		
Long Lake	119		Purchase 1896	196.80
do	120		Purchase 1896	196.80
do	123		Purchase 1896	168
		Total, Township 42, 2,919.20 acres.		
		TOTTEN & CROSSFIELD PURCHASE, TOWNSHIP 50,		
do	...	Gore, unallotted, N. end, all thereof in Hamilton Co.	Original and conveyed 1904	1,580
do	1		1877, '81, '85, '90, '95	163
do	2		1877, '81, '85, '90, '95	124
do	3		1877, '81, '85, '90, '95	124
do	4		Purchase 1891	124
do	7		Purchase 1891	124
do	9		Purchase 1900	124
do	10		Purchase 1900	124
do	11		Pur. 1900 & 1905	124
do	12,13		Purchase 1900	146
do	14,15		Purchase 1900	190
do	16		Purchase 1900	160
do	17		Pur. 1900 & 1905	160
do	18		Purchase 1900	160
do	19		Purchase 1900	160
do	23		1877, '81, '85	160
do	24		1871, '77, '81, '85, '90, '95	160
do	26		Purchase 1900	154.87
do	27		1871, '77, '81, '85, '90, '95	120
do	29		1877, '81, '85	120
do	33		Purchase 1891	120
do	34		Purchase 1900	120
do	35		Purchase 1900	120
do	36		Purchase 1900	120

HAMILTON COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		TOTTEN & CROSSFIELD PURCHASE, TOWNSHIP 50 — (*Continued*)		
Long Lake...	37,38	....	Purchase 1900.....	143
do ...	39,40	....	Purchase 1900.....	192.50
do ...	41	....	Purchase 1901....	160
do ...	42	....	Purchase 1900.....	160
do ...	43	....	Purchase 1900.....	160
do ...	44	....	Purchase 1900.....	160
do ...	45	....	Purchase 1900.....	160
do ...	48	....	1877, ’81, ’85, ’90..	160
do ...	49	....	1877, ’81, ’85......	160
do ...	50	....	1877, ’81, ’85......	160
do ...	51	....	1871, ’77, ’81, ’85, ’95.............	254
do ...	52	....	1871, ’77, ’81, ’85, ’90, ’95.........	160
do ...	53	....	Purchase 1900.....	120
do ...	54	....	Purchase 1900.....	120
do ...	56	....	Pur. 1900 & 1900..	160
do ...	57	....	Purchase 1900.....	160
do ...	58	....	Purchase 1900.....	160
do ...	59	All in Hamilton Co............	Purchase 1891.....	142.25
do ...	60,61	All in Hamilton Co............	Purchase 1900.....	60
do ...	65	All in Hamilton Co............	Purchase 1900.....	88.60
do ...	66	All in Hamilton Co............	Purchase 1900.....	158
do ...	67	....	Purchase 1900.....	160
do ...	68	....	1890, ’00.........	160
do ...	69	....	Purchase 1900.....	120
do ...	72	....	Purchase 1900.....	158.76
do ...	73	....	Conveyed 1891....	120
do ...	76	All in Hamilton Co............	Purchase 1900.....	149.55
do ...	77	All in Hamilton Co............	Purchase 1900.....	44.32
do ...	87	All in Hamilton Co............	Conveyed 1904 and 1910...........	19
do ...	88	All in Hamilton Co............	Purchase 1891.....	120
do ...	89	....	Conveyed 1904 and 1910...........	120
do ...	90	....	Purchase 1900.....	184
do ...	91	All in Hamilton Co............	Conveyed 1900....	68.75
do ...	92	All in Hamilton Co............	Conveyed 1904 and 1910...........	36
		Total, Township 50, 9,440.60 acres.		

HAMILTON COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		TOTTEN & CROSSFIELD PURCHASE — (*Continued*)		
		TOWNSHIP 51, OR GORE OR TRIANGLE NORTH OF TOWNSHIP 38		
Long Lake...	27	All in Long Lake..............	Pur. 1896 & 1900..	62.86
do ...	34	All in Long Lake..............	Pur. 1896 & 1900..	15.20
do ...	35	All in Long Lake..............	Pur. 1896 & 1900..	149.50
do ...	36	....	Pur. 1896 & 1900..	160
do ...	37	....	Pur. 1896 & 1900..	160
do ...	38	....	Pur. 1896 & 1900..	145.76
do ...	39	....	Pur. 1896 & 1900..	48.60
do ...	42	All in Long Lake..............	Pur. 1896 & 1900..	.68
do ...	43	....	Pur. 1896 & 1900..	180.12
do ...	44	....	Pur. 1896 & 1900..	82.88
		Total Gore, N. of Township, 38,–1,005.60a.		
		VROOMAN'S PATENT		
Morehouse...	9	All in Morehouse..............	1885, '90, '95......	66
do ...	10	....	1881, '85, '90.....	200
do ...	11	....	1881, '85, '90.....	200
do ...	12	All in Morehouse..............	1881, '85, '90, '95..	66
do ...	17	All in Morehouse..............	1881, '85, '90, '95..	66
do ...	18	....	1885, '90..........	200
do ...	19	....	1885, '90..........	200
do ...	20	All in Morehouse..............	1881, '85, '90.....	66
do ...	25	All in Morehouse..............	1881, '85, '90, '95..	66
do ...	26	....	1885, '90, '95......	200
do ...	27	....	Pur. 1907 & 1905, '10.............	200
do ...	28	All in Hamilton Co............	Pur. 1907 & 1905 '10.............	66
do ...	34	All in Morehouse..............	1885, '90, '95......	66
do ...	35	Ex. 50a. W. pt. of E. ½.........	1885, '90..........	150
do ...	35	W. pt. of E. ½.................	Purchase 1899.....	50
do ...	42	....	Purchase 1897.....	200
do ...	51	....	1885, '90..........	134
do ...	52	S. end.......................	1885, '90, '95......	34
do ...	52	Ex. 34a. S. end................	Purchase 1899.....	100
		Total, Vrooman's Patent, 2,330 acres.		

HAMILTON COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		WATERS		
Inlet........	...	Fourth Lake, Fulton Chain, All in Twp. 8 Hamilton Co....	Purchase 1897.....	400
do	...	Cascade Lake.................	Purchase 1897....	60
Indian Lake..	...	Indian Lake, all in Twp. 32, T. & C. P......................	Purchase 1897.....	3,256
Arietta......	...	Piseco Lake....................	Original..........	2,432
Long Lake...	...	Raquette Lake, all in Twp. 40, T. & C. P....................	Purchase 1909.....	5,075
do ...	...	Forked Lake, all in Twp. 40, T. & C. P....................	Pur. 1909 & 1871..	147
do ...	...	Cranberry Pond...............	Pur. 1909 & 1871..	27
		Total, Waters, 11,397 acres		

HERKIMER COUNTY

(*Total number of acres,* 192,831.77.)

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		ADGATE'S EASTERN TRACT, *Blake Lot,*		
Ohio........	...	All........................	Purchase 1897....	13,986
		Cramer Lot,		
do	11	....	Purchase 1898.....	212
do	13	....	Purchase 1898....	211
do	14	....	Purchase 1898.....	204
do	15	....	Purchase 1898....	206
do	16	....	Purchase 1898....	203
do	17	....	Purchase 1898.....	202
do	18	....	Purchase 1898....	200.50
do	19	....	Purchase 1898....	189
do	20	....	Purchase 1898....	197
do	21	....	Purchase 1898.....	196.50
do	22	....	Purchase 1898....	195
do	23	....	Purchase 1898....	205.50
do	24	....	Purchase 1898....	183.50
Webb.......	25	....	Purchase 1898....	197
do	26	....	Purchase 1898....	335
do	27	Ex. 19½a. N. W. pt............	Purchase 1898....	156.75
do	28	Ex. 34.83a. E. pt..............	Purchase 1898....	158.17
do	29	....	Purchase 1898....	111
do	30	....	Purchase 1909....	252.75
do	31	Ex. 103.9a. S. pt..............	Purchase 1898....	91.60
do	32	Ex. 02a. S. E. cor.............	Purchase 1898....	190.73
		Devereaux Lot,		
do	19	....	Purchase 1898....	100
do	33	E. pt........................	Purchase 1898....	54.23
do	34	....	Purchase 1898.....	100
do	35	....	Purchase 1898.....	104.86
do	36	....	Purchase 1898....	83.50
do	37	....	Purchase 1898.....	100
do	38	....	Purchase 1898....	142.86
do	39	....	Purchase 1898....	80.80
do	40	....	Purchase 1898....	184.58
		Hamilton Lot,		
Ohio........	...	All........................	Pur. 1898 & 1885..	825

HERKIMER COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		ADGATE'S EASTERN TRACT — (*Continued*) *Kirkland Lot,*		
Ohio........	...	E. ½........................	Purchase 1898....	812
do	...	W. ½........................	Pur. 1900 & 1885, '05............	814
		Miller (J. A.) Lot,		
do	3	....	Purchase 1906.....	100
do	4	....	1881, '85 & purchase 1898......	100
do	5	....	Purchase 1898....	100
do	6	....	1881, '85, '05 and purchase 1898...	100
do	7	Ex. 27.58a. middle E'ly part....	Pur. 1898 & '81, '85............	72.42
do	8	....	1881, '85 and purchase 1898......	100
do	9	....	Pur. 1898 & 1881..	100
do	12	....	1881, '85 and purchase 1898.....	100
do	13	....	1881, '85 and purchase 1898......	100
do	14	....	1881, '85 and purchase 1898......	100
do	15	....	1881, '85 and purchase 1898......	100
do	16	....	1881, '85 and purchase 1898......	100
do	17	....	1881, '85 and purchase 1898......	100
do	18	N. W. cor. sq................	1881, '85 and purchase 1898......	25
		MINUSE (J. H.) TRACT,		
do	2	....	Purchase 1919.....	100
do	3	....	Purchase 1919....	100
do	4	....	Purchase 1919.....	100
do	9	....	1900, '05.........	100
do	12	....	Purchase 1898.....	100
do	13	....	Purchase 1907& '10	100
do	26	....	Purchase 1906....	100
		Total, Adgate's Eastern Tract, 23,483.25 acres.		

HERKIMER COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		BAYARD'S OR FREEMASON'S PATENT,		
Litchfield	64	Sub. 10	Forfeited land (Tory)	10
		BROWN'S (JOHN) TRACT, TOWNSHIP 1,		
Webb	...	Parcel b'd N. by Twp. 2, S. E. by De Camp, S. by Gould and W. by Lewis Co	Purchase 1909	4,607.20
		BROWN'S TRACT, TOWNSHIP 2,		
do	...	All in Herkimer Co. ex. lots 7 to 12 in Ranges 1, 2, 3 and 4	Appropriated 1909.	11,897
		BROWN'S TRACT TOWNSHIP 5,		
do	...	East ½, all ex. 48a. Beaver River Station, lot and 30a. Railway	Pur. 1896 & '00	11,172
do	...	Middle ½, parcel within "right-angle" survey of 1898, 2,754a. ex. 1,407.36a. in reservoir	Appropriated 1898.	1,346.64
do	...	West ½, parcel within "right-angle" survey of 1898, (above old dam) ex. 109.60a. in reservoir	Appropriated 1898.	239.20
		Total Twp. 5, Brown's Tr., 12,757.84 acres.		
		BROWN'S TRACT, TOWNSHIP 6,		
do	...	Parcel within "right-angle" survey of 1898, ex. 80a. reservoir	Appropriated 1898.	289.50
		BROWN'S TRACT, TOWNSHIP 7, *Range* 1,		
do	1		Purchase 1909	160
do	2		Purchase 1909	160
do	3		Purchase 1909	160
do	4		Purchase 1909	160
do	5		Purchase 1909	160
do	6		Purchase 1909	160

HERKIMER COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		BROWN'S TRACT, TOWNSHIP 7, *Range* 1 — (*Continued*)		
Webb	7		Purchase 1909	160
do	8		Purchase 1909	160
do	9		Purchase 1909	160
do	10		Purchase 1909	158.90
do	11	N. W. cor. b'd S. by DeCamp	Purchase 1909	113.70
		***Range* 2**		
do	1		Purchase 1909	160
do	2		Purchase 1909	160
do	3		Purchase 1909	160
do	4		Purchase 1909	160
do	5		Purchase 1909	160
do	6		Purchase 1909	160
do	7		Purchase 1909	160
do	8		Purchase 1909	160
do	9		Purchase 1909	160
do	10	N'ly side b'd S. by DeCamp	Purchase 1909	130.40
do	11	N. W. cor. b'd S. by DeCamp	Purchase 1909	19.80
		***Range* 3**		
do	1		Purchase 1909	160
do	2		Purchase 1909	160
do	3		Purchase 1909	160
do	4		Purchase 1909	160
do	5		Purchase 1909	160
do	6		Purchase 1909	160
do	7		Purchase 1909	160
do	8	W. ½	Purchase 1909	80
do	9		Purchase 1909	160
		***Range* 4**		
do	1		Purchase 1909	160
do	2		Purchase 1909	160
do	3		Purchase 1909	160
do	4		Purchase 1909	160
		***Range* 5**		
do	1		Purchase 1909	160
do	2		Purchase 1909	160
do	3		Purchase 1909	160

HERKIMER COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		BROWN'S TRACT TOWNSHIP 7 — (*Continued*) *Range* 6		
Webb.......	1	....	Purchase 1909....	160
do	...	Dam and Fish Hatchery lot (at Old Forge).................	Appropriated 1879.	11.19
		Total, Twp. 7, Brown's Tract, 5,953.99a.		
		BROWN'S TRACT TOWNSHIP 8,		
do	A	Ex Railway..................	Purchase 1896....	2,453
do	B	....	Purchase 1896....	1,762.50
do	C	....	Purchase 1896....	2,155
do	D	....	Purchase 1896....	3,753
do	E	....	Purchase 1896....	2,468
do	F	....	Purchase 1896....	2,141
do	G	....	Purchase 1897....	244
do	H	....	Purchase 1897....	426
do	I	....	Purchase 1897....	455
do	J	....	Purchase 1897....	933
do	K	All in Herkimer county........	Purchase 1897....	1,946
do	L	....	Purchase 1897....	29.60
do	.....	Parcel b'd S. E. by Railway and W. by Twp. 6..............	Purchase 1900....	497.40
		Total Twp. 8, Brown's Tract, 19,263.50 acres.		
		GORE, BETWEEN MOOSE RIVER TRACT AND NOBLEBORO PATENT,		
Ohio........	.....	All.........................	Original..........	937.00
		JERSEYFIELD PATENT,		
Salisbury....	3	N. W. ¼, 210 acres sq. N. W. cor. and 33⅓ acres, being all after ex. 210 acres sq. in N. W. cor. and the und. ⅓ of the rem....	1885............	243.33
do	3	S. W. ¼ ex. 174 acres S. end thereof of 30 chains wide N. & S. and 58 chains long E. & W.......	1877, '81, '85......	76
do	3	N. E. ¼, 50 acres in the S. W. cor.	1877, '81, '85.....	50
do	5	Sub. 3, 15a. E. end; sub. 4, all 120a. and sub. 5, W. of road 112.84a.	1885........	247.84

HERKIMER COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		JERSEYFIELD PATENT — (*Continued*)		
Salisbury....	6	E. ½, Sub. 1....................	1885, '95.........	100
do	23	All S. of highway in Salisbury...	1895, 1900........	15
do	24	E. ½ and W. ½, Sub. 1 ex. 9a. N. end........................	1881, '85, '15......	617.70
do	35	S. W. ¼......................	1877, '81, '85......	262.50
do	38	W. ½ & N. E. ¼ ex. 25a. S. E. cor.	1877, '81, '85, '95..	762.50
do	39	....	1881, '85, '90......	1,050
do	40	N. E. cor. in Salisbury, 153½a. ex. 15a. N. E. cor..............	1877, '81, '85......	138.25
Ohio.........	48	N. McIntosh part 14a. and parcel of 4.90a. b'd N. W. by Canada Cr. & N. E. by lot line.......	Mortgage and '85, '90.............	18.90
do	52	S. W. cor......................	1881, '85.........	20
do	53	All of W. ½ in Ohio ex. 200a. W. pt........................	Mortgage & 1885..	232.40
Salisbury....	53	All W½ in Salisbury............	Mortgage & 1881..	92.60
do	67	All in Salisbury...............	1877, '81, '85......	66
do	68	W. ½........................	1877, '81, '85, '90..	500
Ohio.........	79	S. E. cor. Chauncey Ferguson lot.	1877 & con. 1917..	98.40
do	80	Bd. N., S. & E. by Radley, & W. by highway.................	1877, '81.........	7
do	82	All in Ohio..................	1881, '85.........	639
Salisbury....	82	All in Salisbury...............	1877, '81, '85......	12
		Total, Jerseyfield Patent, 5,249.42 acres.		
		MACHIN'S PATENT, (*Lush & Marvin's Tract*), *North ½*,		
Russia.......	5	....	1877, '95.........	160
		MOOSE RIVER TRACT, TOWNSHIP 1,		
Webb.......	.....	N. W. part b'd E'ly by lots 32, 33, 34, 35, 36, 37, 38 and 39, S'ly by lots 44, 57, 70, 83, 96, 109, 121, 123 and 143 ex. 1,023 acres preserve of Iroquois Pulp & Paper Co. and ex. 320a. in Wolf and Woodhull lakes.....	Purchase 1919....	14,749

HERKIMER COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		MOOSE RIVER TRACT—(*Continued*) TOWNSHIP 3,		
Webb.......	112	....	Pur. 1908 & 1895, '05, '10.........	160
do	113	....	Pur. 1905 & 1895, '05, '10.........	160
do	114	....	Pur. 1908 & 1895, '05, '10.........	132
do	124	....	Pur. 1908 & 1895, '05, '10.........	160
do	125	....	Pur. 1908 & 1895, '05, '10.........	160
do	126	....	Pur. 1908 & 1895, '05............	140
do	136	....	Pur. 1908 & 1895 '05, '10.........	160
do	138	Ex. 20a. N. W. cor., sq.........	Pur. 1908 & 1895, '05, '10.........	128
		Total, Township 3, M. R. T., 1,200 acres.		
		MOOSE RIVER TRACT, TOWNSHIP 4,		
Ohio........	103	All in Herkimer county........	Purchase 1898....	54
		MOOSE RIVER TRACT, TOWNSHIP 5,		
do	A	N. W. cor. 44 ch, E. & W. and 40 ch. N. & S.................	Pur. 1898 & 1885, '90, '95.........	176
		NOBLEBORO PATENT, NEW SURVEY		
do	1	....	1881, '85, & purchase 1898......	150
do	2	....	1881, '85, & purchase 1898......	150
do	3	....	Pur 1898 & 1885..	150
do	4	....	Pur. 1898 & 1885..	150
do	5	....	Pur. 1898 & '81, '85	150
do	6	....	Pur. 1898 & 1885..	150
do	7	....	1848, 1900........	150
do	8	....	Pur. 1898 & '81, '85	150
do	9	....	Pur. 1898 & 1885..	150

HERKIMER COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		NOBLEBORO PATENT, NEW SURVEY — (*Continued*)		
Ohio	10		Purchase 1898	150
do	11		Pur. 1898 & 1885	150
do	12		Pur. 1898 & '81, '85	150
do	13		Pur. 1898 & '81, '85	150
do	14		Pur. 1898 & '81, '85	150
do	15		Pur. 1898 & 1885	150
do	16		Pur. 1898 & '81, '85	150
do	17		Pur. 1898 & 1885	150
do	18		Purchase 1898	150
do	19		Purchase 1898	150
do	23		1848, 1885	150
do	24		1881, 1885	150
do	25		Pur. 1898, '85	150
do	26		Pur. 1898 & '81, '85	150
do	27		Pur. 1898 & '85	150
do	28		Pur. 1898 & '81, '85	150
do	29		Pur. 1898 & '85	150
do	30		Pur. 1898 & '85	150
do	31		Pur. 1898 & '81, '85	150
do	32		Pur. 1898 & '81, '85	150
do	33		Purchase 1898	150
do	34		Purchase 1898	150
do	35		Pur. 1898 & '85	150
do	36		Pur. 1898 & '81, '85	150
do	37		Pur. 1898 & '85	150
do	38		Pur. 1898 & '85	150
do	39		Pur. 1898 & '85	150
do	40		Pur. 1898 & '85	150
do	42		Pur. 1898 & '85	150
do	43		Pur. 1898 & '85	150
do	44		Pur. 1898 & '85	150
do	46		1881, '85	150
do	47		1877, '81, '85	150
do	48		1877, '81, '85	150
do	49		1881, '85	150
do	52		1877, '81, '85, '90	150
do	53		1877, '81, '85, '90	150
do	54		1877, '81, '85	150
do	56		1881, '85	150
do	57	Ex. 25a. E. end and 100a. W. end	1877, '81, '85, '95	25
do	58		Purchase 1898	150
do	59		1877, '81, '85	150

HERKIMER COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		NOBLEBORO PATENT, NEW SURVEY — (*Continued*)		
Ohio	60		1877, '81, '85, '95	150
do	61		1877, '81, '85	150
do	62		1877, '81, '85, '95	150
do	64		Purchase 1898	150
do	67		1881, '85	150
do	69		Purchase 1900	150
do	70		Purchase 1900	150
do	71		Purchase 1900	150
do	72		Purchase 1900	150
do	74		Purchase 1898	150
do	75		Purchase 1898	150
do	76		Purchase 1898	150
do	77		Purchase 1898	150
do	78		Purchase 1898	150
do	81		Purchase 1898	150
do	87		Purchase 1898	150
do	90		1871, '77, '81	150
do	91		1871, '77, '81, '85	150
do	93		1881, '85 & purchase 1899	150
do	94		1848	150
do	95		1881, '85 & purchase 1899	150
do	97		1871, '77, '81	150
do	98		1871, '77, '81	150
do	99		Purchase 1898	150
do	100		Purchase 1898	150
do	101		Pur. 1898 & '81	150
do	102		1871, '77, '81	150
do	103		1881, '85	150
do	104		1871, '77, '81	150
do	105		1877, '81, '85	150
do	106		Purchase 1900	150
do	107		Pur. 1900 & '10	150
do	108		Purchase 1900	150
do	109		Purchase 1900	150
do	110		Purchase 1898	150
do	111		Purchase 1898	150
do	112		Purchase 1900	150
do	113		Purchase 1898	150
do	115		1881, '85 & purchase 1899	150

HERKIMER COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		NOBLEBORO PATENT, NEW SURVEY — (*Continued*)		
Ohio	116	W. pt	1881, '85	125
do	117		1881, '85	150
do	118		Purchase 1898	150
do	119		Purchase 1898	150
do	120		Purchase 1898	150
do	121		1881, '85	150
do	122		1881, '85	150
do	123		1877, '81, '85	150
do	124		Purchase 1898	150
do	125		1877, '81, '85	150
do	126		1848, '85	150
do	127		1877, '81, '85	150
do	129		1871, '77, '81	150
do	130		1881, '85	150
do	131		1881, '85	150
do	132		1877, '81, '85, '90	150
do	134		Purchase 1898	150
do	136		Purchase 1898	150
do	137		1881, '85	150
do	138		1881, '85	150
do	139		1881, '85	150
do	140		1871, '77, '81	150
do	141		1881, '85	150
do	143		1881, '85	150
do	145		Purchase 1898	150
do	146	Ex. 50a. S'ly end	Purchase 1900	100
do	147	Ex. 50a. S'ly end	Purchase 1900	100
		OLD SURVEY,		
do	1	Parcel in middle center b'd N. by reservoir, E. by 925a. E'ly part of lot, S. by lot line and W. by 175a. parcel, ex. 1a (Fuller) on reservoir	Purchase 1898	399
do	6	E. ½	Purchase 1898	150
do	39		Pur. 1898 & '81	300
do	40		Pur. 1898 & '81 '85	300
do	41		Pur. 1898 & '81 '85	300
do	42		Pur. 1898 & '81, '85	300

HERKIMER COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		NOBLEBORO PATENT, OLD SURVEY — (*Continued*)		
Ohio	43		Pur. 1898 & '81, '85	300
do	44		Pur. 1898 & '81 '85	300
do	45		Pur. 1898 & '81, '85	300
do	46		Pur. 1898 & '81, '85	300
do	47		Pur. 1898 & '81, '85	300
do	49		Pur. 1898 & '81, '85	300
do	99	E. end	Purchase 1898 & 1871, '77, '81 '00	200
do	107	Sub. 3	Purchase 1908 & 1910	200
do	108		Pur. 1901 & '05	272
		Total, Nobleboro Patent, 21,521 acres.		
		REMSENBURGH PATENT,		
do	8	All of N. ½ & S. E. ¼ in Wilmurt	Purchase 1899 & 1881, '90, '05	277
do	9	Ex. 20a. N. W. cor. N. of Pine. Creek	Purchase 1898	480
do	12	S. ½	1881, '85, '90	250
do	13		1881, '85 & purchase 1898	500
do	31	Sub. 6 N. W. cor. bd. S. by Twin Lk. Rd. and Clancy farm.	Purchase 1900 & 1895, '00, '05	55.15
do	33		Purchase 1898 & '81, '85	500
do	34		Purchase 1898 & '81, '85	500
do	35		Pur. 1898 & '81, '85	500
do	36		Pur. 1898 & '81, '85	250

HERKIMER COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		REMSENBURGH PATENT — (*Continued*)		
Ohio	37		Pur. 1898 & '81, '85	500
do	38		Pur. 1898 & '81, '85	500
do	39		Pur. 1898 & '81, '85	500
do	40		Purchase 1899	500
do	41		Purchase 1899	500
do	46	E. pt. 274a. ex. 50a. N. end	1900 '05 and purchase 1900	224
do	47	Ex. 110a. W. end of S. ½	Purchase 1899	390
do	52	Sub. 4, being N. ½ of S. ⅔ of lot	1881, '85	100
do	60	Sub. 2, all formerly in Wilmurt	1885, '90	35.50
do	65	Ex. 74a. subs. 11 & 12 of subdiv. of lots 63, 64, 65, 68, 74, 75 & 76	Purchase 1900	426
do	63, 64, 65, 68, 74, 75 & 76	Sub. 20	Mortgage	87.66
do	63, 64, 65, 68 74, 75, & 76	Sub. 21, all formerly in Wilmurt.	Mortgage	45.90
do	66		Purchase 1906 & 1910	500
do	67		Purchase 1908	500
do	72		Pur. 1898 & '85	392
do	73		Pur. 1898 & '85	465
		Total, 8,978.21 acres.		
		ROYAL GRANT, FOURTH ALLOTMENT,		
Salisbury	125	S. W. ¼	1881	50
do	142	N. W. cor. sq. 30a., and S. W cor. sq. 30a	1877, '81	60
		Mary Johnson Tract		
do	13	Emmonsburg Tannery lot	1900	13

HERKIMER COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		ROYAL GRANT — (*Continued*) *Susannah Johnson Tract,*		
Salisbury	15	In S. W. cor. b'd W. by W. Ereanbrack, N. by J. D. Hall, E. by J. Keyser & S. by Ellis & Hall, formerly owned by D. A. Beach	Mortgage	54
do	28	W. end	Mortgage	15
		Total Royal Grant, 272.32 acres.		
		TOTTEN & CROSSFIELD PURCHASE TOWNSHIP 38,		
Webb		N. part b'd E. by County line and S. by Nehasene Park	Purchase 1896	818
		TOTTEN & CROSSFIELD PURCHASE, TOWNSHIP 41,		
do		N. W. Cor N'ly of Big Moose Lake	Purchase 1919	2,088
		TOTTEN & CROSSFIELD PURCHASE, TOWNSHIP 42,		
do	1		Purchase 1896	209
do	2		Purchase 1896	225.50
do	3		Purchase 1896	225.50
do	4		Purchase 1896	225.50
do	5		Purchase 1896	225.50
do	6		Purchase 1896	225.50
do	15		Purchase 1896	225.50
do	16		Purchase 1896	225.50
do	17		Purchase 1896	225.50
do	18		Purchase 1896	225.50
do	19		Purchase 1896	225.50
do	20		Purchase 1896	209
do	21		Purchase 1896	182.40
do	22		Purchase 1896	196.80
do	23		Purchase 1896	196.80
do	24		Purchase 1896	196.80
do	37		Purchase 1896	196.80
do	38		Purchase 1896	196.80
do	39		Purchase 1896	196.80
do	40		Purchase 1896	182.40
do	41		Purchase 1896	182.40

HERKIMER COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		TOTTEN & CROSSFIELD PURCHASE, TOWNSHIP 42 — (*Continued*)		
Webb.......	42	Ex. 6a. Railway..............	Purchase 1896....	190.80
do	43	Ex. 6a. R. R. right of way......	Purchase 1896....	190.80
do	44	Ex. 4a. R. R., right of way.....	Purchase 1896....	192.80
do	45	S. W. Cor....................	Purchase 1896....	75.00
do	52	....	Purchase 1896....	196.80
do	53	....	Purchase 1896....	196.80
do	54	Ex. 1a. R. R., right of way.....	Purchase 1896....	195.80
do	55	Ex. 6a. right of way of R. R., & 6a. N. of said right of way....	Purchase 1896....	184.80
do	56	Ex. right of way of R. R. & all of lot N. thereof............	Purchase 1896....	153.80
do	65	....	Purchase 1896....	196.80
do	66	....	Purchase 1896....	196.80
do	67	....	Purchase 1896....	196.80
do	68	....	Purchase 1896....	196.80
do	69	....	Purchase 1896....	196.80
do	70	....	Purchase 1896....	182.40
do	71	....	Purchase 1896....	182.40
do	72	....	Purchase 1896....	196.80
do	73	....	Purchase 1896....	196.80
do	74	....	Purchase 1896....	196.80
do	75	....	Purchase 1896....	196.80
do	76	....	Purchase 1896....	196.80
do	85	....	Purchase 1896....	196.80
do	86	....	Purchase 1896....	196.80
do	87	....	Purchase 1896....	196.80
do	88	....	Purchase 1896....	196.80
do	89	....	Purchase 1896....	196.80
do	90	....	Purchase 1896....	182.40
do	91	....	Purchase 1896....	182.40
do	92	....	Purchase 1896....	196.80
do	93	....	Purchase 1896....	196.80
do	94	....	Purchase 1896....	196.80
do	95	....	Purchase 1896....	196.80
do	96	All in Webb.................	Purchase 1896....	180.40
do	97	All in Webb.................	Purchase 1896....	18.70
do	105	All in Webb.................	Purchase 1896....	64.50
do	106	....	Purchase 1896....	196.80
do	107	....	Purchase 1896....	196.80
do	108	....	Purchase 1896....	196.80
do	109	....	Purchase 1896....	196.80
do	110	....	Purchase 1896....	182.40

HERKIMER COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		TOTTEN & CROSSFIELD PURCHASE, TOWNSHIP 42 — (*Continued*)		
Webb.......	111	....	Purchase 1896....	182.40
do	112	....	Purchase 1896....	196.80
do	113	....	Purchase 1896....	196.80
do	114	....	Purchase 1896....	196.80
do	115	All in Webb..................	Purchase 1896....	132.30
		Total, Township 42, 12,585.50 acres.		
		TOTTEN & CROSSFIELD PURCHASE, TOWNSHIP 43,		
do	1	....	Purchase 1896....	166.85
do	2	....	Purchase 1896....	166.85
do	3	....	Purchase 1896....	197.40
do	4	....	Purchase 1896....	197.40
do	5	....	Purchase 1896....	197.40
do	6	....	Purchase 1896....	197.40
do	7	....	Purchase 1896....	197.40
do	8	....	Purchase 1896....	197.40
do	9	....	Purchase 1896....	168
do	10	....	Purchase 1896....	60.80
do	11	....	Purchase 1896....	150.40
do	12	....	Purchase 1896....	197.40
do	13	....	Purchase 1896....	197.40
do	14	....	Purchase 1896....	197.40
do	15	....	Purchase 1896....	197.40
do	16	....	Purchase 1896....	197.40
do	17	....	Purchase 1896....	197.40
do	18	....	Purchase 1896....	197.40
do	19	....	Purchase 1896....	166.85
do	20	....	Purchase 1896....	166.85
do	21	....	Purchase 1896....	166.85
do	22	....	Purchase 1896....	166.85
do	23	....	Purchase 1896....	197.40
do	24	....	Purchase 1896....	197.40
do	25	....	Purchase 1896....	197.40
do	26	....	Purchase 1896....	197.40
do	27	....	Purchase 1896.....	197.40
do	28	....	Purchase 1896....	197.40
do	29	....	Purchase 1896....	197.40
do	30	....	Purchase 1896....	150.40
do	31	....	Purchase 1896....	150.40
do	32	....	Purchase 1896....	197.40

HERKIMER COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		TOTTEN & CROSSFIELD PURCHASE, TOWNSHIP 43 — (*Continued*)		
Webb	33		Purchase 1896	197.40
do	34		Purchase 1896	197.40
do	35		Purchase 1896	197.40
do	36		Purchase 1896	197.40
do	37		Purchase 1896	197.40
do	38		Purchase 1896	197.40
do	39		Purchase 1896	166.85
do	40		Purchase 1896	166.85
do	41		Purchase 1896	166.85
do	42		Purchase 1896	166.85
do	43		Purchase 1896	197.40
do	44		Purchase 1896	197.40
do	45		Purchase 1896	197.40
do	46		Purchase 1896	197.40
do	47		Purchase 1896	197.40
do	48		Purchase 1896	197.40
do	49		Purchase 1896	197.40
do	50		Purchase 1896	150.40
do	51		Purchase 1896	150.40
do	52		Purchase 1896	197.40
do	53		Purchase 1896	197.40
do	54		Purchase 1896	197.40
do	55		Purchase 1896	197.40
do	56		Purchase 1896	197.40
do	57		Purchase 1896	197.40
do	58		Purchase 1896	197.40
do	59		Purchase 1896	166.85
do	60		Purchase 1896	166.85
do	61		Purchase 1896	166.85
do	62		Purchase 1896	166.85
do	63		Purchase 1896	197.40
do	64		Purchase 1896	197.40
do	65		Purchase 1896	197.40
do	66		Purchase 1896	197.40
do	67		Purchase 1896	197.40
do	68		Purchase 1896	197.40
do	73		Purchase 1896	197.40
do	74		Purchase 1896	197.40
do	75		Purchase 1896	197.40
do	76		Purchase 1896	197.40
do	77		Purchase 1896	197.40
do	78		Purchase 1896	197.40

HERKIMER COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		TOTTEN & CROSSFIELD PURCHASE, TOWNSHIP 43 — (*Continued*)		
Webb	79		Purchase 1896	166.85
do	80		Purchase 1896	166.85
do	81		Purchase 1896	166.85
do	82		Purchase 1896	166.85
do	83		Purchase 1896	197.40
do	84		Purchase 1896	197.40
do	85		Purchase 1896	197.40
do	86		Purchase 1896	197.40
do	87		Purchase 1896	197.40
do	88		Purchase 1896	197.40
do	93		Purchase 1896	184.80
do	94		Purchase 1896	184.80
do	95		Purchase 1896	184.80
do	96		Purchase 1896	184.80
do	97		Purchase 1896	184.80
do	98		Purchase 1896	184.80
do	99		Purchase 1896	156.20
do	100		Purchase 1896	156.20
do	104	Ex. 171$\frac{6}{10}$a. E. pt.	Purchase 1896	13.20
do	105		Purchase 1896	184.80
do	106		Purchase 1896	184.80
do	107		Purchase 1896	184.80
do	108		Purchase 1896	184.80
do	109		Purchase 1896	156.20
do	110		Purchase 1896	156.20
do	111		Purchase 1896	182.40
do	112		Purchase 1896	196
do	113		Purchase 1896	196
do	114		Purchase 1896	196
do	115		Purchase 1896	196
do	116		Purchase 1896	196
do	121		Purchase 1896	75.60
do	122		Purchase 1896	174.30
do	123		Purchase 1896	197.40
do	124		Purchase 1896	197.40
do	125		Purchase 1896	197.40
do	126		Purchase 1896	197.40
do	127		Purchase 1896	166.85
do	128		Purchase 1896	166.85
do	129		Purchase 1896	166.85
do	130		Purchase 1896	166.85
do	131		Purchase 1896	197.40

HERKIMER COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		TOTTEN & CROSSFIELD PURCHASE, TOWNSHIP 43 — (*Continued*)		
Webb	132		Purchase 1896	197.40
do	133		Purchase 1896	174.30
do	134		Purchase 1896	75.60
do	135		Purchase 1896	75.60
do	136		Purchase 1896	174.30
do	137		Purchase 1896	166.85
do	138		Purchase 1896	166.85
do	139		Purchase 1896	125.85
do	140		Purchase 1896	53.78
		Total, Township 43, 22,393.93 acres.		
		TOTTEN & CROSSFIELD PURCHASE, TOWNSHIP 51 OR TRIANGLE NORTH OF TOWNSHIP 38,		
do	1		Purchase 1896	140
do	2		Purchase 1896	214.36
do	3		Purchase 1896	117.24
do	4		Purchase 1896	140
do	5		Purchase 1896	160
do	6		Purchase 1896	160
do	7		Purchase 1896	180.80
do	8		Purchase 1896	82.88
do	9		Purchase 1896	143.80
do	10		Purchase 1896	164
do	11		Purchase 1896	164
do	12		Purchase 1896	164
do	13		Purchase 1896	164
do	14		Purchase 1896	146.60
do	15		Purchase 1896	143
do	16		Purchase 1896	164
do	17		Purchase 1896	164
do	18		Purchase 1896	164
do	19		Purchase 1896	164
do	20		Purchase 1896	140
do	21		Purchase 1896	160
do	22		Purchase 1896	160
do	23		Purchase 1896	160
do	24		Purchase 1896	160
do	25		Purchase 1896	160
do	26		Purchase 1896	160

HERKIMER COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		TOTTEN & CROSSFIELD PURCHASE, TWP. 51 OR TRIANGLE, NORTH OF TOWNSHIP 38 — (*Continued*)		
Webb.......	27	All in Webb................	Purchase 1896....	97.14
do	29	....	Purchase 1896....	160
do	30	....	Purchase 1896....	160
do	31	....	Purchase 1896....	160
do	32	....	Purchase 1896....	160
do	33	....	Purchase 1896....	160
do	34	All in Webb................	Purchase 1896....	144.80
do	35	All in Webb................	Purchase 1896....	11.50
do	40	....	Purchase 1896....	164
do	41	....	Purchase 1896....	164
do	42	All in Webb................	Purchase 1896....	118.28
do	45	....	Purchase 1896....	48.60
do	46	....	Purchase 1896....	127.30
		Total, Twp. 51 or Triangle N. of Twp. 38, T. & C. P., 5,716.30 acres.		
		VROOMAN'S PATENT,		
Ohio........	1	Parcel b'd E. by Canada Creek and S. by Wilkinson lot......	Purchase 1907....	355.50
do	12	All in Ohio..................	1881, '85.........	134
do	13	S. ½ of N. ½..................	1881, '85.........	50
do	17	All in Ohio..................	1881, '85.........	134
do	20	All in Ohio..................	Purchase 1899 & 1881, '85.......	134
do	24	....	Purchase 1907, '08.	200
do	25	All in Ohio..................	1881, '85.........	134
do	28	All in Ohio..................	Pur. 1907 & 1905..	134
do	29	....	Purchase 1907....	200
do	30	N. ½.........................	Pur. 1907 & 1905..	100
do	33	....	Pur. 1907 & 1905..	200
do	34	All in Ohio..................	1885, '90.........	134
do	41	All in Ohio, 134a. ex. 18a. N. W. pt. thereof................	1881, '85.........	116
		Total, Vrooman's Patent, 2,025.50 acres.		
		WATSON'S EAST TRIANGLE		
Webb.......	4	All in Webb................	Pur. 1908, '09. ...	255
do	6	....	1877,'81,'85,'90,'05. & conveyed 1903	542

HERKIMER COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		WATSON'S EAST TRIANGLE — (*Continued*)		
Webb.......	7	W. ½..........................	1877, '81, '85, '90..	286
do	9	N. W. cor. sq.................	1885, '90, '95, and conveyed 1903..	475
do	10	....	1885, '90, '95, and conveyed 1903...	671.10
do	12	N. W. cor. sq.................	1885, '90, '95, and conveyed 1903..	500
do	13	....	1877, '81, '85 and conveyed 1903..	1,053
do	15	E. pt. 346a. & 100a. N. W. cor. sq. of 334¾a. W. pt..........	1877,'81,'85,'90,'95, & conveyed 1903	446
do	17	....	Pur. 1908 & 1910..	695
do	18	N. ½ & S. E. ¼................	Pur. 1908 & 1910..	520.50
do	19	....	Pur. 1908 & 1910..	690.57
do	22	All in Herkimer County........	Purchase 1909....	318
do	23	....	Pur. 1908 & 1910..	715
do	24	....	Pur. 1908 & 1910..	704
do	25	N. W. Cor. sq.................	Purchase 1918....	390
do	27	Parcel in S. W. Cor...........	1885, '95, '00......	96.47
do	28	S. pt. of W. ½................	1885, '90, '95......	68.25
do	29	....	Pur. 1899 & 1881, '85, '90.........	658
do	34	....	Pur. 1908 & 1910..	702
do	36	S. E. cor. 81c. on N. 30¼c.. on E. 80c. on S. and 29¼c. on W. line.	Purchase 1908....	239.48
do	40	N. W. cor. sq.................	1885, '90, '95 and conveyed 1903..	130
		Total, Watson's East Triangle, 10,155.37 acres.		
		WOODHULL TRACT,		
Ohio........	1	....	Purchase 1899....	653.04
do	4	....	Purchase 1898....	624
do	6	....	1881, '85, '95......	600
do	7	All in Ohio...................	1877, '81, '85......	92
do	12	All in Ohio...................	1881, '85.........	166
		Total, Woodhull Tract, 2,135.04 acres.		

HERKIMER COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		WATERS		
Webb........	.....	Big Moose Lake, All in Twp. 8, Brown's Tract..............	Purchase 1897....	975.20
do	.....	Bub's Lake..................	Purchase 1897....	52
do	.....	Rondaxe Lake (First Lake No. Branch)....................	Purchase 1897....	84.40
do	.....	Dart's Lake (Second Lake North Branch)....................	Purchase 1897....	115
do	.....	Silver Lake..................	Purchase 1897....	62
do	.....	Moss Lake..................	Purchase 1897....	118
do	.....	Razor Back Lake..............	Purchase 1897....	7.50
do	.....	Second Lake, Fulton Chain.....	Purchase 1897....	140
do	.....	Third Lake, Fulton Chain......	Purchase 1897....	230
do	.....	Fourth Lake, Fulton Chain, all in Herkimer County.........	Purchase 1897....	1,390
do	.....	Thirsty Pond................	Purchase 1897....	30
do	.....	Twitchell Lake..............	Purchase 1897....	145.60
do	.....	West Pond..................	Purchase 1897....	5.20
		Total waters, 3, 354.90 acres.		

LEWIS COUNTY

(*Total number of acres*, 9,014.86.)

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		BOYLSTON PURCHASE, TOWNSHIP 13		
Osceola	38	N. W. ½	1881, '85	62
do	50	Bd. N. by Potter or Porter, E. & W. by lot lines, & S. by Brockway	1877	61
do	50	N. ½, und. ½	1885	61.50
do	69	N. end	1881, '85	25
do	74		1877, '81, '85	236
do	98	N. W. cor. bd. E. by Hinman & Williams 120a. & S. W. cor. bd. N. & E. by R. Steward, 62a	1881, '85	182
do	127		1881, '85	265
do	134	Bd. N. & S. by Driscol, & E. & W. by lot line	1881, '85	83
		Total, Township 13, 975½ acres.		
		BRANTINGHAM TRACT,		
Greig	95	S. pt. " W. Trull "	1877, '81, '85	141
do	113	N. ½	1877, '81, '85	102
do	171	W. side 50a. ex. 16⅔a. all contained therein of 50a. bd. N. by Bender, E. & W. by lot lines, & S. by Smith	1877	33.33
do	187	E. pt. or side	1881, '85	73
do	188		1881, '85	236
do	189	Ex. 50a. N. E. cor	1881, '85	104.67
Lyonsdale	203	E. side 32a. and Swartz, 70a. bd. N. & S. by lot lines, E. by Brown & W. by Warner	1871, '77, '81, '95	102
do	204		1871, '77, '81	183
do	205	W. side bd. E. by Bogart, 144a., & S. E. cor. of Rem. 30c. long, N. & S. 33a	1877, '81, '85	177
do	222	N. E. cor., bd. S. by Paint Creek, & W. by road	1871, '77, '81	2.50
do	223	N. E. cor. b'd. S. by Paint Creek and E. & N. by lot lines	1877, '81, '90	113
do	226	E. pt	1877, '81	77
do	262	N. E. cor. bd. S. by river	1877	50
do	305	N. W. cor. bd. E. by Rodgers & S. by river	1877, '81, '85	14

LEWIS COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		BRANTINGHAM TRACT — (*Continued*)		
Lyonsdale....	308	Bd. N. by Chase, E. & S. by Rodgers & W. by Banning....	1881.............	14
do	311	S. W. cor., bd. N. by Holcomb, & E. by G. H. Brown........	1881.............	50
do	314	....	1877, '81, '85......	181
		Total, Brantingham Tract, 1,653½ acres.		
		BROWN'S (JOHN) TRACT, TOWNSHIP 1,		
Greig........	...	N. part ex. Copper Lake preserve.	Purchase 1919.....	4,298.48
		INMAN'S TRIANGLE,		
Lewis.......	153	E. side......................	1877 '81, '90......	147
do	153	N. W. cor....................	1877, '81, '90......	50
		Total, Inman's Triangle, 197 acres.		
		LYONS FALLS VILLAGE BLOCK 7		
West Turin..	5	N. W. ½ und. ½...............	1881.............	.13
		MACOMB'S PURCHASE, GREAT TRACT 4,		
Diana.......	906	S. W'ly cor., bd. N'ly by William Hunt & others, & E'ly by Hammond & Morse lands....	1881.............	50
do	924	Simon Van Patten bd. N'ly by lot line, E'ly by Paddock & Judson & G. W. Leonard, S'ly by Paddock & Judson & Wm. Leonard, & W'ly by Wm. A. Paddock & Judson lands.....	1881, '85.........	66
do	924	McKenna est. bd. N'ly by St. Law. Co., E'ly by Lyman Barber, S'ly by lot 925, & W'ly by Wm. Leonard...........	1885.............	65
do	990	Bd. N'ly by lot 991, E'ly by lots 337 & 338, S. by lot 989 & Seeley, & W'ly by Hughes & Paul's land................	1881, '85.........	290

LEWIS COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		MACOMB'S PURCHASE, GREAT TRACT 4—(*Continued*)		
		TRIANGLE IN EASTERLY END,		
Diana.......	1	S. part bd. N'ly & W'ly by Beach, E'ly, by Humes.............	1881, '85.........	90
do	2	N'ly part bd. E'ly by Humes, S'ly by Buell & Bartholomew, & W'ly by Beach & Buell or Bush & Buell...............	1881, '85.........	219
		Total, Great Tract 4, 780 acres.		
		MACOMB'S PURCHASE, GREAT TRACT 5, *Chassinis Tract,*		
Croghan.....	1977	Range 4, W. 24, N., N. pt......	1881.............	20
		MACOMB'S PURCHASE,— GREAT TRACT 6, TOWNSHIP 1,		
Lewis.......	20	E. side, 199½a. ex. 135a. E. pt. thereof.....................	1877, '81, '85......	64.50
do	38	....	1881, '85.........	257
do	44	....	1877, '81, '85......	259
do	57	E. side......................	1877, '81, '85......	100
		Total, Township 1, 680½ acres.		
		TOWNSHIP 3, LUCRETIA CONSTABLE'S PURCHASE,		
Turin.......	84	Bd. N'ly by Carpenter, E'ly by Parsons & others, S'ly by lot line, & W'ly by Roberts, deceased..................	1877.............	2
do	84	Bd. N'ly & E'ly by Carpenter, S'ly by lot line, & W'ly by Coe & others..................	1877.............	3
do	84	Bd. N'ly, E'ly & W'ly by Doud's land, & line thereof same course continued, S'ly by lot line....	1877.............	4
do	84	S. W. cor. bd. N'ly by Carpenter, & E'ly by Coe..............	1877.............	3
		Total, Township 3, 12 acres.		

LEWIS COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		WATSON'S EAST TRIANGLE,		
Watson......	4	All in Lewis Co................	Purchase 1908, '09.	236.32
do	22	All in Lewis Co. of 228.61a N. pt. and 156.82a. S. E. cor. of lot	Purchase 1909.....	67.43
		Total, Watson's East Triangle, 303.75 acres.		
		WATSON'S WEST TRIANGLE,		
do	240	S. part........................	1877, '81, '85......	48.00
		WILKES' TRACT,		
Greig........	5	S. part........................	1866.............	46.00

ONEIDA COUNTY

(*Total number of acres,* 28,008.71.)

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		ADGATE'S EASTERN TRACT, *Gouverneur Lot,*		
Forestport...	...	Ex. 100a. S. pt. (T. Delarme)...	1877, '81.........	600
		Miller & Swanton Lot,		
do ...	10	....	1877, '85..........	350
do ...	14	N. pt......................	1877, '81, 85......	300
do ...	14	Sub. 1......................	Mortgage.........	50
do ...	15	....	1877, '81, '85.....	462
		Total, Adgate's Eastern Tract, 1,762 acres.		
		ADGATE'S WESTERN TRACT, (*East side of Black River*)		
Boonville....	55	N. pt. bounded E. by E. line of lot, W. by the Patent line and lot 9 in said Tract, and S. by line par'l with N. line of lot, drawn so as to include 25a. ..	Mortgage.........	25
do	56	Excepting so much, if any, as is included in a farm of 51½a., surveyed for Wm Booth, under contract to Stephen Barns....	Mortgage*........	155.75
do	62	Excepting that part lying N'ly on the Brown's Tract Road, under contract to Richard Lee	Mortgage*........	160.50
do	63	....	Mortgage*........	164.50
do	74,75 76, 79	Parts thereof, being premises conveyed by Morris S. Miller & others to Richard Hurlburt, Jan. 15, 1856................	Mortgage.........	155.89
do	75,76 & 79	Beg. at a point in E. line of lot 74 where crossed by Dan'l Thayer's N. line th. N'ly 4c. 25l. along said E. line to center of road th. E'ly along said road to a point intersected by S'ly line of B. Churchill's lot, th. E'ly along said line to birch tree cornered and marked, th.		

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* Resale 1920.

ONEIDA COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		ADGATE'S WESTERN TRACT EAST-SIDE OF BLACK RIVER) — (*Continued*)		
Boonville....		S'ly on a line par'l with Thayer's E. line & 9c. distant therefrom 35c. to center of Cummins' Creek, th. N. & W. along the said creek to Thayer's S. E. cor. th. N'ly along Thayer's E. line to his N. E. cor. and th. W'ly along his N. line 10ch. to beg................	Mortgage.........	50
do	75,76 & 79	Parts thereof bd. beg. at hemlock tree, on N side of Cummins' Creek, about 1½c. below Burgess' sawmill; th. N. 10 deg. E. 7c. 50l. to a beech marked; th. N. 80 deg. E. 40c. 50l. to a hemlock, marked; th. S. 10 deg. E. 16c. 75l. to a spruce, marked; th. S. 71 deg. W. 49c 46l. to Cummins' Creek, at a spruce, marked & th. up said creek 33c. 50l. to beg., 100a. ex. 15a. pt. of lot 75 as surveyed by C. L. Phelps, 1864, deeded to Andrew Wells......	Mortgage.........	85
		Total, Adgate's Western Tract, Eas Side Black River, 796.64 acres.		
		BAYARD'S, OR FREE MASON'S PATENT		
Bridgewater..	5	Sub. 7........................	Forfeited.........	2.50
		ONEIDA RESERVATION, *Purchase of* 1840,		
Vernon......	5	N. part......................	Original & resale 1899...........	30
do	28	Part.........................	Original & resale 1899...........	6.65
		Total, Oneida Reservation, 36.65 acres.		

ONEIDA COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		REMSENBURGH PATENT		
Forestport...	3	Sub. 3....................	1881, '84.........	93
Remsen......	8	N. W. cor. bd. E. by Her. Co., S. S. by O'Brien............	1895............	120
Forestport...	19	S. W. ¼.....................	1877............	125
do ...	21	S. E. cor. bd. N. & W. by river..	1877............	3
		Total, 341 acres.		
		SCRIBA'S PATENT, TOWNSHIP 3,		
Annsville....	13	S. E. cor....................	1877............	18
do	80	In N. ½ $2\frac{4}{16}$a. & all of S ½ of lot ex. 50a. W. end thereof, $48\frac{8}{16}$a.	Mortgage.........	50.75
do	81	All..........................	Mortgage.........	154.50
do	112	W'ly ⅓ of 152 $\frac{82}{100}$a. bd. beg. at N. E. cor. of lot, th. S. 21° W. along E. line of said lot 62c. 15l. to S. E. cor. thereof, th. N. 69 deg. W. along S. line of lot 24c. 60l. to a stake, th. N. 21 deg. E. along a line of marked trees 62c. 13l. to N. line of said lot and th. S. 69 deg. E. 24c. 60l. to beg.......	Mortgage.........	50.94
		Total, Twp. 3, 274.19 acres.		
		SCRIBA'S PATENT. TOWNSHIP 8, (*West Part in Camden*)		
Camden.....	8	Bd. N. by lands of Abram Skinner, E. by F. Skinner, S. by lands formerly of Strong, and W. by Robt. Robertson......	1877............	30
do	44	N. W. cor. bd. E. by Fish Creek, & S. & W. by lands of Miner Buell or Buel..............	1871, '77.........	3
		Total Twp. 8, 33 acres.		
		SCRIBA'S PATENT, TOWNSHIP 9,		
Vienna......	19	N. W. cor..................	1877............	14
do	54	Parcel beg. at the S. W. cor. of lot, th. N. 22 deg. E. along E. line of lot 53, 43c. 82l. to N. E.		

ONEIDA COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		SCRIBA'S PATENT, TOWNSHIP 3 — (*Continued*)		
Vienna......		cor. of lot 53, th. S. 68 deg. E. 6c. 84l. to stake and stones, th. S. 22 deg. W. 43c. 82l. to hemlock sapling on S. line of lot 54, th. N. 68 deg. W. 6c. 84l. to beg. ex. 1½a. sold Dun and 5a. to Nathaniel Danly N. end of lot........................	Mortgage.........	1.50
do	54	Part 30a. ex. 1.50a. Dun and ex. 5a. deeded Dawley..........	Mortgage.........	23.50
		Total Twp. 9, 39 acres.		
		SCRIBA'S PATENT, TOWNSHIP 10, *North Part,*		
do	9	....	Mortgage.........	155
do	21	Bd. N'ly by land of Jno. Pierce, E'ly by Pierce, S'ly by lot 32, W'ly by lot 20.............	Mortgage........	70
do	31	N. end......................	1877.............	79
do	33	....	Mortgage.........	151.75
do	50	N. ½........................	C. T. 1884 & Mtge.	50
do	55	W. ½ of 49½a. S pt............	Mortgage.........	24.75
do	66	W. pt., bd. beg. at N. E. cor. of lot 65, th. S. 68 deg. E. along lot line 7c. 75l. to stake, th. S. 22 deg. W. 33c. to stake on N. line of Peter J. Monroe's tract, th. N. 80 deg. W. along Monroe's N. line, 8c. 4l. to S. E. cor. of lot 65, & th. 22 deg. E. along E. line of lot 65, 35c. to beg.................	Mortgage.........	26.84
		South Part,		
do	29	N. ½........................	Mortgage.........	50
do	30	S. ⅓ of N. ¼ of N. ½............	Mortgage.........	12.50
		Total, Twp. 10, 619.84 acres.		
		WILLETT'S (MARINUS) 2,000 ACRE TRACT,		
Steuben...:	5	W. ½........................	Mortgage.........	80

ONEIDA COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		WOODHULL TRACT,		
Forestport...	13 & 21	Sub. 16	1877, '81, '85	55
do ...	31	N. W. 55a. und. ½	1890	27.5
do ...	38	Sub. 5, S. ½	Mortgage	59
do ...	38	Sub. 6	Mortgage	114.39
do ...	39	Sub. A	Mortgage	50
do ...	39	Sub. B	Mortgage	50
do ...	39	Sub. 3	1877, '81 Mortgage	180
do ...	39	Sub. 4, 5 & 6	Mortgage	156
		Total, Woodhull Tract, 691.89 acres.		
		WATERS.		
do ...	...	White Lake, including land flowed by dam	Appropriated, 1880	332
do ...	...	Oneida Lake, all in Oneida Co.	Original	23,000
		Total, Waters, 23,332 acres.		

ST. LAWRENCE COUNTY

(*Total number of acres*, 102,506.73.)

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		CANTON TOWNSHIP, MILE SQUARE LOTS, *Range* 1, MORLEY VILLAGE,		
Canton	2	E. N. Fulton waterpower lot, S. side of Grasse River, bd. N. by Covey water lot, E. by J. Johnson Ashery lot, S. by old sawmill lot, and W. by the Beswick lot (containing 94x54 links)	1885	.05
		RANGE 3,		
do	7	Sub. 6, S. W'ly ½	1871	25.00
		Total, 25.05a.		
		COLUMBIA VILLAGE, *Main Street, North Side*		
Madrid	14		1871	
		COOPER'S FALLS VILLAGE,		
DeKalb		Bd. N., N'ly or N. E'ly by village lots 13, 14, 15 & 17, E'ly, S. E'ly or S'ly by center of road from DeKalb village to Cooper Falls village, S'ly or S. W'ly by river or ravine, street or avenue to be laid out 100 ft. wide from said road to Oswegatchie river, and N. W'ly by river	1866, '71, '77	2.50
		FORD TRACT, (*South of Oswegatchie River*) SECTION 1,		
Gouverneur	3		1885, '90, '95	8.44
do	6		1885, '90	10.54
		Total, 18.98 acres.		

ST. LAWRENCE COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		LISBON TOWNSHIP, MILE SQUARE LOTS, RANGE 5,		
Lisbon......	5	Sub. 21......................	1895, 1900........	20.38
		RANGE 7		
do	1	Sub. 17, E'ly pt. bd. W'ly by 20a. sold to H. Moncrief.....	1885, '90.........	11.74
		Total, Lisbon Township, 32.12 acres.		
		LOUISVILLE TOWNSHIP, MILE SQUARE LOTS,		
Louisville....	41	S'ly end......................	Mortgage.........	350.33
		MACOMB'S PURCHASE GREAT TRACT 2, TOWNSHIP 1, (*Sherwood*) *North West ¼*		
Clifton......	...	Ex. 2,733⅓a. N. E. cor. 227c. N. & S., & 120c. 42l. E. & W., after reserving therefrom 267.05a., Cranberry Lake & flowed lands therein (ex. 1,072.77a. water on S. part)................	1877, '81, '85.....	4,653
		South West ¼		
do	...	S. W. cor....................	1881, '85.........	300
		Total, Township 1, 4,953 acres.		
		GREAT TRACT 2, TOWNSHIP 3,		
Piercefield...	2	....	Purchase 1918....	672
do ...	4	....	Purchase 1918....	637
do ...	8	All N. of Bog River and E. of Railway....................	Purchase 1918....	51
do ...	9	All N. of Bog River............	Purchase 1918....	238
do ...	10	All N. of Bog River...........	Purchase 1918....	235
do ...	12	....	Purchase 1918....	536

St. Lawrence County

Town	Lot	DESCRTPIION	Source of title and tax sale	Acres
		Macomb's Purchase, Great Tract 2, Township 3,—(*Continued*)		
Piercefield	16	S'ly part W. of Big Tupper Lake ex. Paradise Point	Purchase 1918	206
do	17	S. E. ¼	Purchase 1918	161
do	18	Ex. N. ½ of N. E. ¼	Purchase 1918	536
do	19	Ex. 1a. boat house site	Purchase 1918	664
do	20	Ex. 5a. opposite R. R. Station	Purchase 1918	485
do	21	All E. of Railway	Purchase 1918	10
do	23	All E. of Railway	Purchase 1918	200
do	24		Purchase 1918	654
do	25	Ex. S. ½ of S. E. ¼	Purchase 1918	517
do	26	N. ½ & N. ½ of S. W. ¼	Purchase 1918	374
do	27	N. ½ ex. islands	Purchase 1918	152
do	30	Ex. Sprague Camp Site	Purchase 1918	250
do	31		Purchase 1918	583
do	32		Purchase 1918	553
do	33	All E. of Railway	Purchase 1918	499
do	34	All E. of Railway	Purchase 1918	38
do	39	S. E. ¼	Purchase 1918	145
do	40		Purchase 1918	633
do	41	Ex. Sprague Camp site	Purchase 1918	599
do	42	All W. of Big Tupper Lake ex. Sprague Camp site	Purchase 1918	188
do	45		Purchase 1918	656
do	54		Purchase 1918	655
do	55		Purchase 1918	614
		Total Twp. 3, 11,741.00 acres.		
		Great Tract 2, Township 4, (*Harewood*) ***South East ¼,***		
Clifton		Ex. 5,250a., N. pt. & 1,954.92a., being all that remains of 2,355a. S. pt. after ex. therefrom 319.6a. Cranberry Lake & flowed lands around same, and also 80.48a. dam site lot	1877, '81, '85	400.10

ST. LAWRENCE COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		MACOMB'S PURCHASE, GREAT TRACT 2—(*Continued*) TOWNSHIP 5, (*Jamestown*)		
Colton......	.....	N. E. cor. 1 mile sq............	1877, '81, '85, '95..	640
do	1	On N. line 1 mile W. of N. E. cor.	1877, '81, '85, '95..	640
do	2	On N. line 2 miles W. of N. E. cor.	1877, '81, '85......	640
do	3	On N. line 3 miles W. of N. E. cor.	1877, 1881, '85....	640
do	4	On E. line 1 mile S. of N. E. cor.	1877, '81, '85, '90..	640
do	5	1 mile W. of E. line & 1 mile S. of N. line of Township..........	1871, '77, '81, '85..	640
do	6	2 miles W. of E. line & 1 mile S. of N. line of Township.......	1871, '77, '81, '85..	640
		Total, Township 5, 4,480 acres.		
		GREAT TRACT 2, TOWNSHIP 7, (*Granshue*)		
do	.....	Bd. beg. at post N. 2 deg. E. 205c. from S. W. cor. of Twp. th. S. 88 deg. E. 145c. to post, th. N. 2 deg. E. 145c. to post, th. N. 88 deg. W. 140c. to W. line of Twp. & th. S. 2 deg. W 147½c. to beg...............	1877,'81&Co.Tr.'01 & conveyed 1910	2,100
		GREAT TRACT 2, TOWNSHIP 8, (*Hollywood*)		
do	10	S. E. cor. 56¾c. E. & W and 30.35c. N. & S..............	Purchase 1905....	172.25
do	30	....	1877, '81, '85......	544
do	34	....	1877, '81, '85......	582
do	35	....	1877, '81, '85......	641
do	36	....	1877, '81 '85......	679
		Total, Township 8, 2,618¼ acres.		
		GREAT TRACT 2, TOWNSHIP 9, (*Kildare*)		
Hopkinton...	6	....	1877, '81, '85......	610
do ...	7	....	1877, '81, '85......	610

ST. LAWRENCE COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		MACOMB'S PURCHASE, GREAT TRACT 2, TOWNSHIP 9, *Kildore* — (*Continued*)		
Hopkinton...	9	Und. ⅙........................	1877..............	101.66
do ...	14	....	1877, '81, '85......	610
do ...	15	....	1877, '81, '85......	610
do ...	23	....	1877, '81, '85......	610
do ...	24	....	1877, '81, '85......	610
do ...	40	....	1877, '81, '85......	610
do ...	47	....	1877, '81 '85......	610
		Total, Township 9, 4,981⅔ acres.		
		GREAT TRACT 2, TOWNSHIP 11, (*Wick*)		
Parishville...	1	Ex. parcel in N. W. cor.........	Purchase 1919....	433.83
do ...	2	....	Purchase 1919....	598.61
do ...	3	Ex. Clear Pond preserve in E. end	Purchase 1919....	576.75
do ...	4	Ex. Clear Pond preserve in W. end.......................	Purchase 1919 & 1877, '81, '85, '90	548.40
do ...	5	W. part 294a. ex. Wheeler's 27a. lot beg. on N. line of lot 9c. 63l. E. of N. W. cor., 12c. 75l. N. & S. & 22c. E. & W............	1877, '81, '85......	267
do ...	11	W. pt..........................	1877, '81..........	265
do ...	13	S. W. cor. S. & W. of road......	1871..............	38.
		Total, Township 11, 2,727.59 acres.		
		GREAT TRACT 2, TOWNSHIP 13,		
do ...	37	N. E. cor. and middle E. end, 2 parcels.....................	Purchase 1919.....	46.27
do ...	38	S. E. corner..................	Purchase 1919.....	2.30
do ...	45	N. and E. sides...............	Purchase 1919.....	187.97
do ...	46	S. E. part....................	Purchase 1919.....	108.39
do ...	47	S. E. corner..................	Purchase 1919.....	18.65
		Total, Township 13, 363.58 acres.		

ST. LAWRENCE COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		MACOMB'S PURCHASE, GREAT TRACT 2,—(*Continued*) TOWNSHIP 14, (*Catherinesville*) *Short (Wm.) Tract,*		
Hopkinton...	3	P. Harper lot, bd. N. by river lot, E. & S. by A. Squires & Gillen, & S. W. & W. by St. Regis River................	1885, '90.........	16
Parishville...	15	Ex. N. E. and N. W. parts......	Purchase 1919.....	207.55
do ...	16	S. end.......................	Purchase 1919.....	130.38
do ...	17	....	Purchase 1919.....	344.47
do ...	18	....	Purchase 1919.....	616.36
Hopkinton...	35	S. W. corner..................	Purchase 1919.....	360.60
		Total, Township 14, 1,675.36 acres.		
		GREAT TRACT 3, TOWNSHIP 3, (*De Witt*) MIDDLE ⅓, (*Harrison Tract*)		
Pierrepont....	14	Sub. 8........................	1881.............	53
		GREAT TRACT 3, TOWNSHIP 5, (*Ballybeen*) WEST PART, (*Harrison Tract,*)		
Russel........	27	Ex. 161½a. W. part, bd. E. by Butler......................	1895.............	132.50
		GREAT TRACT 3, TOWNSHIP 6, (*Clare*) *East ½,*		
Clare........	2 & 5	Bd. beg. at S. W. cor. of sec. 2, th. N. 3c. 75l. along W. bounds of said section, th. E. 42c. 11l. par'l with S. line, th. S. 23c. 75l. to tree, cornered & marked, & th. W. 42c. 12l. to post, cornered, & th. N. 20c. to beg.......................	Mortgage.........	100

ST. LAWRENCE COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		MACOMB'S PURCHASE, GREAT TRACT 3 — (*Continued*) TOWNSHIP 9, (*Sarahsburgh*) *Section* 11,		
Fine	...	E. & H. Clark, cedar lot, bd. N. by Ames, E. by Brown, S. by Holland, & W. by Ames	1881, '85	7
do	...	Bd., N. by Knox, E. by Ames, S. by Ells, W. by Proctor	1895	5
do	...	Grant, T., bd. N. by Proctor & Ames, E. by Brown, S by Worthington, & W. by State land	1895, 1900	7.50
		Total, Township 9, 19.50 acres.		
		GREAT TRACT 3, TOWNSHIP 11, (*Pontaferry*) *Brodie Tract,*		
Pitcairn	102	S. W. cor. bd. N. & E. by J. Thompson	1895, '00	45
do	108		1895, '00	193
do	109		1895, '00	225
do	110		1895, '00	158
do	119	S. E. cor. bd. N. by Thompson & W. by Harris & the Luther lot.	1881, '85	83.81
do	119	W. pt. bd. E. by Thompson or Thompson & Beach & Dodge	1881, '85	104.78
do	121	W. pt. bd. E. by Hoy or Luther	1881, '85	97
do	124	S. E. cor. 19c wide N. & S. & 41c. 14l. long E. & W. (A. Harris lot)	1895, '00	78.51
do	130	S. ¾	1895 & con. 1912	142.82
do	131	Ex. Right of way of R.R.	1895	118.53
do	133		1895, '00	194
do	134		1895, '00	170
do	157	N. pt	1885	164
do	177	N. W. cor. bd. E. by Streeter & S. by Fleming lot	1885, '90, '95	50
		Havens Tract,		
do	3		1885, 1895	113.87
		Total, Township 11, 1,938.32 acres.		

ST. LAWRENCE COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		MACOMB'S PURCHASE, GREAT TRACT 3—(*Continued*) TOWNSHIP 12, (*Scriba*) *East ½*,		
Fine.........	30	Bd. N. by Beebe, E. by town line, S. by Colby or Kellogg, & W. by Pitcher or Pickett lot...	1881.............	68
		West ½,		
do	19	Haskell lot, bd. N. by Township line, E. by Evans, S. by Hitchcock, Phillips & highway & W. by Anderson................	1895, 1900........	29
do	28	E. pt. across bd. W. by Hunt....	1895.............	33
		Total, Township 12-130 acres.		
		TOWNSHIP 14, (*Bloomfield*) *South ½*,		
do	...	E. ½, 354½c. N. & S. & 67c. 55l. E. & W.....................	Purchase 1908.....	2,394.65
do	...	On N. line of S. ½, 67c, 52l. W'ly from N. E. cor. thereof, 104c. 86l. N'ly & S'ly, & 67c. 52l. E'ly & W'ly.................	Purchase 1907.....	708
		Total, Township 14, 3,102.65 acres.		
		GREAT TRACT 3, TOWNSHIP 15, (*Emilyville*) *North West ¼*,		
do	...	Ex. 9.86a. R. R. right of way; 105a on N. line W. of R. R. of way; right 10a. on E. line N. of inlet to lake and ex. 2a., Genson & Parker, near W. side	Purchase 1908.....	7,262
		North East ¼,		
do	...	All S. of right of way of R. R.; Wanakena Village and River allotment ex. 28a. W. end on inlet to lake (Dr. Fred. Calkins and others).................	Purchase 1919.....	4,411

ST. LAWRENCE COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		MALCOMB'S PURCHASE GREAT TRACT 3, TOWNSHIP 15, (*Emilyville*) — (*Continued*)		
		South ½,		
Fine	...	All ex. Buck Pond and surrounding land, 24a	Purchase 1908,1919 & 1877, '81, '85, '95	14,754
		Total. Twp. 15, 26,427 acres.		
		MADRID TOWNSHIP,		
		Mile-Square Lots,		
Waddington	28	Bd. N. by Brosnan, now Rutherford, E. by Rutherford, and S. & W. by G. F. Rutherford	1895, '00	7
do	42	Bd. N. & W. by Wilson, E. by Sheridan & S. by Crane	1895, '00	3
		Total, 10 acres.		
		NINETEEN THOUSAND ACRE TRACT, ALLOTMENT 14,		
De Peyster	7		1881, '85	77.64
do	8	E'ly pt. Geo. Parker lot, bd. N. by Black Lake, & W'ly by land of Bridges	1885, '00	3.06
		Total, 80$\frac{7}{10}$ acres.		
		NORFOLK VILLAGE		
Norfolk	77	Sub. 23, part, bd. beg. above Bridge Forge ot 1, at S'ly cor. of the stone abutment at N. end of bridge, th. S. 51 deg. E. 1c. 38l., th. S. 56 deg. 50 min. E. 1c. th. S. 33 deg. 30 min. W. 1c 38l. to river shore, th. to beg	1866	.15
		ST. REGIS RESERVATION, INDIAN MEADOWS (*Along Grasse River*).		
Massena	5		Original	1.85
do	8		Original	.45
do	9		Original	.84
do	11		Original	.76

ST. LAWRENCE COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		ST. REGIS RESERVATION, INDIAN MEADOWS. (*Along Grasse River*) — (*Continued*)		
Massena.....	19	....	Original..........	.12
do	20	....	Original..........	.18
do	21	....	Original..........	.12
do	22	....	Original..........	.20
do	23	....	Original..........	.21
do	24	....	Original..........	.30
do	25	....	Original..........	.24
do	30	....	Original..........	4
do	31	....	Original..........	2
do	36	....	Original..........	1.75
do	38	....	Original..........	4.35
do	39	....	Original..........	1
do	40	....	Original..........	1.85
do	41	....	Original..........	1.63
do	45	....	Original..........	1.15
do	46	....	Original..........	.35
do	47	....	Original..........	1.50
do	50	....	Original..........	.61
do	52	....	Original..........	2.93
do	53	....	Original..........	15
		Total, 43.39 acres.		
		WATERS ST. LAWRENCE RIVER,		
....	...	All in St. Lawrence Co.........	Original..........	34,000

SARATOGA COUNTY

(*Total number of acres*, 10,019.29.)

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		DARTMOUTH PATENT, SMALL TRACT, *Range* 4		
Hadley......	3	Bd. N. by town line, E. by lot 4, S. by Jonathan Flanders & W. by Alexander Kennedy......	1877, '81, '85.....	36
		Range 11,		
do	...	Bd. beg. at W. end of lot 6, of Lower River division of said Patent, th. N. 30 deg. W. 33c. to a birch tree S. W. cor. of lot 7, th. S. 81 deg. W. 45c. to lot 1 in Range 10 of said small Tract, th. S. 30 deg. E. to N. W. cor. of land of John B. Aldrich & Reuben Wells & th. E. 47c. in N. line of Aldrich & Wells' land to beg..................	Mortgage.........	114
		Total, Dartmouth Patent, 150 acres.		
		GLEN AND YATES PATENT,		
Day.........	6	....	1885, '90.........	200
do	7	....	1885, '90.........	200
do	13	N. W. cor. bd. E. & S. by Perkins or Wood..................	1877, '81.........	200
do	16	....	1895, 1900........	16
do	21	N. ½ or end..................	1885, '90, '95.....	100
		Total, Glen & Yates Patent, 716 acres.		
		GLEN (JOHN) AND 44 OTHERS' PATENT,		
Edinburgh...	39	All in Edinburgh.............	1877, '81, '85.....	138
Corinth.....	39	All in Corinth................	1881, '90.........	112
do	51	All in Corinth................	1881, '85, '90.....	86
Edinburgh.	85,86, 87,88	Sub. 3......................	1877, '81, '85, '95..	100
	do	Sub 6.......................	1881, '85.........	100
	do	Sub. 7......................	1871, '77, '81.....	100
	do	Sub. 9......................	1877, '81, '85.....	100
	do	Sub. 10.....................	1877, '81.........	100
do ...	112	W. pt.......................	1885.............	50
		Total, 886 acres.		

SARATOGA COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		KAYADEROSSERAS PATENT, 17TH ALLOTMENT, *Great Lot* 6		
Greenfield	9	Bd. N. by land of Ebert, E. by Sesselman, S. by schoolhouse and highway from Style's to Greenfield Ctr., & W. by highway N'ly from School No. 9	1895, '00	1.00
do	12	Bd. N. by highway from Stile Tavern to H. Lockwood's, E. by Great Lot 7, S. by Morris & W. by Williams	Mortgage	40.15
		Great Lot 7,		
do	2	Sub. 20, Diana Russell b'd W. by Hodges	1915	1.25
		Great Lot 9,		
Wilton	...	Harry J. Byant parcel in S. W. cor. of Gt. Lot 9	1915	1.00
		21ST ALLOTMENT, *Great Lot* 8,		
Providence	2	Sub. 6, W. ½	1890	100
		Great Lot 10		
do	3	Sub. 1, S. W. cor. square	1890	10
		Great Lot 11,		
do	4	Sub. 8	1885	107
		23D ALLOTMENT, *Great Lot* 2,		
Corinth	1	Bd. beg. in center of highway S'ly past W. W. Grippen's house, at a point where A. N. Clothier's land commences, th. W'ly along Clothier's S. line to A. M. Young's land, th. S. along Young's E. line & lands of Kingsley to R. P. Clothier's land, then E. along said Clothiers' N. line to where Clothier's		

SARATOGA COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		KAYADEROSSERAS PATENT, 23D ALLOTMENT, *Great Lot* 2—(*Continued*)		
Corinth......		land runs N. past this lot, th. N. to highway and th. along center of highway past W. W. Grippen's dwelling to beg....	Mortgage.........	51
		24TH ALLOTMENT, *Great Lot* 1, (*Town of Corinth*)		
do	1	Sub. 2 or B..................	1890, '95.........	348
do	2	Sub. 1 N. end................	1885, '90.........	100
do	2	Sub. 2 S. part...............	1881, '85, '90. '95..	100
		(*Town of Day*)		
Day........	2	Sub. 1.......................	1890.............	100
		Great Lot 2, (*Town of Corinth*)		
Corinth......	1 or A	Sub. 1, N. pt. bd. S. by Hewitt Clark & others, 900a. ex. 200a. S. ⅓ of 600a., N. end.........	1881, '85, '90	700
do	2 or B	S. pt. 737a., ex. 400a. bd. N. by the Chrysler lot, E. & W. by lot lines, & S. by Houghton..	1881, '85, '90.....	337
		Great Lot 3, (*Town of Corinth*)		
do	1	Sub. A.......................	1881, '85, '90.....	175
do	1	Sub. B.......................	1881, '85, '90.....	175
do	1	Sub. C.......................	1881, '85, '90.....	175
do	2	Sub. 1, N. pt. bd. S. by Carpenter or Martin.................	1881, '85, '90.....	503
do	2	Sub. 2, S. pt. bd. N. by Tiffany.	1881, '90.........	90
		Great Lot 4,		
do	1	Sub. 2, ex. 150a. S. end........	1881, '85, '90.....	311
		Great Lot 5,		
do	2	Bd. N. by 1, S. Murray, E. & W. by lot lines, & S. by C. Johnson	1890.............	100
do	2	Sub. 1, on S. end, or S. pt. bd. N. by Widow White's lot........	Mortgage & 1885..	100

Saratoga County

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		KAYADEROSSERAS PATENT, 24TH ALLOTMENT, — (*Continued*) *Great Lot* 6,		
Corinth	1	Sub. N. N. pt.	1881, '85, '90	35
do	2	Sub. H	1890, '95	100
		Great Lot 8,		
do	2	Bd. N. by Holden, E. & W. by lot lines, & S. by J. R. Cruse..	1881	60
		Total, Kayaderosseras Patent, 3,820.40 acres.		
		NORTHUMBERLAND, TOWN OF		
Northumberland	...	Farm lot No. 1 on a map of Herman Ganesvort, made by Jos. Mott; bd. beg. at N. W. cor., a stake in S. line of land of John Snyder, being N. E. cor. of land of Windsor Hartwell, th. S. along E. line of Hartwell land 15c. 56l. to N. line of John Burt, th. E. along said N. line 9c. 50l., th. 15c. 56l. to John Snyder, & th. W. along Snyder's land 9c. 50l. to beg..	Mortgage	14.71
		Also a parcel in said lot 1, bd. beg. on S. line of E. Merchant, being N. W. cor. of S. Gifford, th. W. 32c. to pt. in road, 2r. from stump on W. side of road, th. N. 31 deg. E. 57l. to N. line of lot 2, said map, th. W. on N. line 39c. 2l. th. S. on E. line of lot 5, said map, 8c. 21l. to N. line of C. Cramer, th. 11c. 14l. to Cramer's N. E. cor., th. S. along Cramer's line 8c. 22l. to stake in J. Snyder's N. line, th. E. along Snyder's N. line 54c. 96l. to S. W. cor. of S. Gifford's & th. N. along Gifford's W. line 8c. 22l. to beg..	Mortgage	75.18
		Total, $89\frac{89}{100}$ acres.		

SARATOGA COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		PALMER'S PURCHASE *General Allotment*		
Day.........	16	All in Day....................	1877.............	37
do	25	All in day....................	1881, '85.........	66
do	26	All in day....................	1881, '85.........	290
do	27	All in day....................	1877, '85, '81 ,'10 & purchase 1907	555
do	30	N. pt. of all in Saratoga Co., bd S. by land of Sherman & Lapham......................	1881, '85.........	509
do	31	All in Saratoga Co. ex. 888a. S. E. end....................	1877, '81, '85.....	61
do	44	N. end......................	1895, 1900........	600
do	45	Ex. 700a. N. end & 150a. S. end.	1877, '81, '85.....	150
do	47.48	Sub. 7, Edwin Pryor, bd. N. by Hunt and Mosher, E. by Duel and Kathan, S. by F. Mosher and W. by W. Rhodes.........	1915	45
		Total, 2,313 acres.		
		MIDDLE DIVISION, **GREAT LOT 2,** *West Part, Bruce Tract,*		
do	19	....	1881, '85, '90.....	104
do	20	....	1895, '00.........	104
		Great Lot 3,		
do	26	....	1895, '00.........	64.30
do	27	....	1895, '00.........	64.30
do	28	....	1895, '00.........	64.30
do	29	....	1895, '00.........	64.30
do	30	....	1895, '00.........	64.30
do	31	....	1895, '00.........	64.30
do	32	....	1895, '00.........	64.30
do	33	....	1895, '00.........	64.30
do	34	....	1895, '00.........	64.30
do	35	....	1895, '00.........	64.30
		Total, Middle Division, 851 acres.		

SARATOGA COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		PALMER'S PURCHASE — (*Continued*) RIVER DIVISION, GREAT LOT 2, ***East Part, Middle Part,***		
Hadley	...	Bardine Mosher; being a sub division of the Mindwell Newton farm	1915	4.00
		SANDERS' PATENT,		
Corinth	15		1890, '95	100
do	17		1890, '95	100
do	12	Bussing lot	1881 '85 & mortgage	95
Day	23	N. end in Day	1885, '90, '9	53
Corinth	29		1890, '95	99
do	30		1890, '95	96
do	31		1881, '85	87
do	32		1881, '85	87
do	33		1890, '95	87
do	34		1890, '95	87
do	35		1890, '95	101
do	37		1890, '95	101
do	44	All in Corinth	1890	77
		Small Lots		
do	3		1890	17
		Total, Sanders' Patent, 1,187 acres.		
		VISCHER'S FERRY VILLAGE,		
Clifton Park	...	Pearse; Ella or Anna; bd. N. by John Irish, E. by highway, S. by Burt Peorult and W. by Burt Perult and Irish	1915	2.00
		WATERS,		
		Hudson River, all in Saratoga Co. ex. so much thereof as is within Kayaderosseras Patent and Saratoga Patent	Original	
		Mohawk River, All in Sarato a Co	Original	

WARREN COUNTY

(*Total number of acres,* 153,626.26.)

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		Brant Lake Tract,		
Hague.......	2	All in Warren Co	Purchase 1908....	67
do	3	....	Purchase 1908....	120
do	4	....	Purchase 1908....	120
do	5	....	Purchase 1908....	120
do	6	....	Purchase 1908....	120
do	7	....	Purchase 1908....	144
do	8	....	Purchase 1908....	160
do	9	....	Purchase 1908....	160
do	10	....	Purchase 1908....	160
do	16	....	1877, '81, '85.....	160
do	17	....	1877, '81, '85, '90, '95............	160
do	18	....	1877, '81, '85, '90, '95............	160
do	19	....	1877, '81, '85, '90, '95............	160
do	22	....	1877, '81, '85, '95..	160
do	23	....	1877, '81, '85.....	160
do	24	....	1877, '81, '85, '95..	160
do	25	....	1881, '85.........	160
do	30	....	1895, '00.........	160
do	32	....	Purchase 1908....	160
do	33	....	Purchase 1908....	160
do	34	All in Warren Co.............	Purchase 1908....	112
Horicon.....	37	All in Warren Co.............	Pur. 1908 & 1910..	104
do	38	....	Purchase 1908....	160
do	39	....	Pur. 1908 & 1910..	160
do	41	....	Original & resale 1899...........	160
do	64	....	Pur. 1908 & 1910..	160
do	65	....	Pur. 1908 & 1910..	160
do	66	All in Warren Co.............	Pur. 1908 & 1910..	97
do	69	All in Warren Co.............	Pur. 1908 & 1910..	95
do	70	....	Pur. 1908 & 1910..	160
do	71	....	Pur. 1908 & 1910..	160
do	96	....	Pur. 1908 & 1910..	160
do	97	....	Pur. 1908 & 1910..	160
do	98	All in Warren Co.............	Pur. 1908 & 1910..	95
do	101	All in Warren Co.............	Pur. 1908 & 1910..	91
do	102	....	Pur. 1908 & 1910..	160

WARREN COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		BRANT LAKE TRACT — (*Continued*)		
Horicon	103		Pur. 1908 & 1910	160
do	128		Pur. 1908 & 1910	160
do	129		Pur. 1908 & 1910	160
do	130	All in Warren Co	Pur. 1908 & 1910	88
do	133	All in Warren Co	Pur. 1908 & 1910	85
do	134		Pur. 1908 & 1910	160
do	160		Pur. 1908 & 1910	160
do	162	All in Warren Co	Pur. 1908 & 1910	81
do	165	All in Warren Co	Pur. 1908 & 1910	77
do	194	All in Warren Co	Pur. 1908 & 1910	75
		Total, Brant Lake Tract, 6,331 acres.		
		CALDWELL, TOWN OF, LAKE GEORGE CAMP GROUND, *Block* 8,		
Caldwell	13		1910	.03
		DARTMOUTH PATENT, GREAT TRACT,		
		Range 4,		
Stony Creek	5		1871, '77, '85	234
		Range 5,		
Thurman	3		1885	234
Stony Creek	11		1885	234
do	13		1885, '90. '95	234
		Range 6,		
Thurman	5		1877, '81, '85	234
do	6		1877, '81, '85, '90	234
do	7		1881, '85	234
do	11		1900, '05 & purchase 1900	234
		Range 7,		
do	10		Pur. 1897 & 1881	234
do	11		Pur. 1897 & 1881	234

WARREN COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		DARTMOUTH PATENT, (GREAT TRACT) — (*Continued*) *Range* 8,		
Thurman....	6	....	1881............	234
do	7	....	1877, '81, '85, '90..	234
do	8	....	Purchase 1897....	234
do	9	....	Purchase 1897....	234
do	10	....	Purchase 1897.....	234
do	11	....	Purchase 1897....	234
do	12	....	Purchase 1897....	234
do	13	....	Purchase 1897....	234
		Range 9,		
do	2	S. ½ of 67a. W. part...........	1890............	33.50
do	6	Ex. 50a. N. E. cor............	Purchase 1897....	184
do	7	....	Purchase 1897....	234
do	8	....	Purchase 1897....	234
do	10	....	Purchase 1897....	234
do	11	....	Purchase 1897....	234
do	12	....	Purchase 1897....	234
do	13	....	Purchase 1897....	234
		Range 10,		
do	6	....	Purchase 1897....	234
do	7	....	Purchase 1897....	234
do	8	Ex. 27½a. N. E. cor. 5c. on E'ly. 25c. on S'ly & 16.8c. on W'ly line......................	Purchase 1897....	206.75
do	9	....	Purchase 1897....	234
do	10	....	Purchase 1897....	234
do	11	....	Purchase 1897....	234
do	12	....	Pur. 1906 & 1910..	234
do	13	....	Purchase 1897....	234
		SMALL TRACT, *Range* 4,		
Stony Creek .	3	All in Warren Co............	1885, '90.........	198
do	4	....	1881, '85, '90.....	234
do	5	N. end......................	1881, '90.........	100
		UPPER RIV. DIVISION,		
do	4	....	1890, '95.........	144
do	5	W. ½.......................	1877............	50

WARREN COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		DARTMOUTH PATENT, UPPER RIV. DIVISION — (*Continued*)		
Stony Creek	6	W. ½	1877, '90	50
		Total, Dartmouth Patent, 8,454.25 acres.		
		ELLIS PATENT,		
Hague	...	Gore, All in Warren Co. (bd. E'ly by Lots 86, 87, 88 and 89)	Pur. 1908 & 1905	837 90
do	105		1881, '85, '10	120
do	226		Purchase 1908	112
do	236		1895, '00	115.60
do	237		1895, 1900	102.50
do	245		1895, 1900	100.30
do	246		1895	102.60
do	248		1871, '77, '81	102.60
do	250		1895, '00	107.50
do	251		1895, '00	105.40
do	252		1895, '00	148.60
do	255		1895, '00	100.30
do	256		1895, '00	102.60
do	257		1871, '77, '81	94.50
do	258		1895, '00	123.60
do	259		1895, '00	126.75
		Total, Ellis Patent, 2,502.75 acres.		
		GARLAND'S (PETER) PATENT,		
Bolton	3		1877, '90, '95	169
do	5	N. W. cor	1895	50
		Total, 219 acres.		
		GOLDWAITH'S PATENT, *N. W.* ¼,		
Warrensburgh	...	Ex. 400a. W. end 80c. long E. & W. & 50c. wide N. & S	1895	100

WARREN COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		GORES, GORE BETWEEN DARTMOUTH PATENT AND TOWNSHIP 11, TOTTEN & CROSSFIELD PURCHASE,		
Thurman	1		1885, '90	127.25
do	2		1885, '90	160
do	3		1881, '85	160
Johnsburgh	4	All in Johnsburgh	1881, '85, '90	50
Thurman	4	All in Thurman	1885	110
do	5	S. W. cor. in Thurman	1885, '95	26
Johnsburgh	7		Purchase 1897	160
do	8		Purchase 1906	160
Thurman	14		1885, '90	38.33
do	15		Purchase 1897	119
do	16		Purchase 1897	180.25
do	17	All in Thurman	1881, '85	154.50
Johnsburgh	17	All in Johnsburgh	1885, '90	5.50
do	18	All in Johnsburgh	Purchase 1897	75
Thurman	18	All in Thurman	Purchase 1897	85
Thurman	26		Purchase 1897	90.32
do	27	Ex. 56.08a. E'ly side	Purchase 1897	106.25
do	28	All in Thurman	1881	142
Johnsburgh	28	All in Johnsburgh	1881	18
do	33	All in Johnsburgh 935a., ex. 700a N. Pt. bd. S. by line par'l to town line	1890, '95	235
Thurman	35		Purchase 1897	72.33
		Total, 2,274.73 acres.		
		GORE BETWEEN TOWNSHIPS 12 AND 14, TOTTEN & CROSSFIELD PURCHASE.		
Johnsburgh	196		1885	106
		GORE BETWEEN TOWNSHIPS 29 AND 31, TOTTEN & CROSSFIELD PURCHASE,		
do	7	All in Warren Co	Purchase 1891	38.50
do	8	All in Warren Co	1885 & conveyed 1905	157.80
do	9		1885, '05	169.60
do	10		1881	169.60
		Total, 535.50 acres.		

WARREN COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		GORE SOUTH OF TOWNSHIP 12, TOTTEN & CROSSFIELD PURCHASE, (*West of River*)		
Johnsburgh..	5	....	1895, '00.........	279.52
do ..	8	....	1900.............	475.59
do ..	13	....	1881, '85.........	157.76
do ..	26	....	1881, '85.........	171.53
do ..	30	....	1890.............	264.50
do ..	31	....	1885, '90.........	149.88
		Total, Gore south of Twp. 12, 1,498.78 acres.		
		HAGUE TRACT,		
Hague.......	28	All in Warren Co..............	Purchase 1908....	14.50
do	29	All in Warren Co..............	Purchase 1908....	68
do	30	....	Purchase 1908....	170.20
do	31	....	Purchase 1908....	175.50
do	32	....	Purchase 1908....	175.50
do	33	....	Purchase 1908....	145.70
do	34	....	Purchase 1908....	165.30
do	35	....	Purchase 1908....	157.10
do	36	....	Purchase 1908....	160
do	37	....	Purchase 1908....	160
do	38	....	Purchase 1908....	184.50
do	39	....	Purchase 1908....	184.50
do	41	....	Purchase 1908....	184.50
do	42	....	Purchase 1908....	184.50
do	50	....	1877, '81, '85, '95..	150
do	54	....	Original & re-sale 1858...........	180
do	57	....	1877, '81, '85, '95..	184.50
do	58	....	1877, '81, '85, '95..	184.50
do	60	....	1881, '85.........	184.50
		Total, Hague Tract, 3,013.30 acres.		
		HOFFMAN TOWNSHIP		
Chester......	93	S. E. cor. & S. W. cor..........	1877, 1881.	285

WARREN COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		HYDE TOWNSHIP,		
Thurman....	17	N. W. cor. & S. W. cor.........	1871, 1881........	100
do	17	On W. line, so much of 50a. commencing 26r. N. from the S. W. cor. of lot, 160r. long N. & S and 50r. wide, E. & W. as is not contained in 50a. N. W. cor. and 50a. S. W. cor..........	1881.............	30.17
do	37	Sub. 1......................	1885, '90.........	125
do	37	Sub. 2, N. W. side, 17½c. wide N. W. & S. E. and 20c. long N. E. & S. W.	1885,'90.........	35
do	39	S. W. cor. square.............	1881.............	80
Warrensburgh	64	Sub. 4......................	1881, '95.........	61
do	64	N. ½ of S. W. ¼ ,63a., ex. 25a. on W. line 31c. 4l. from N. W. cor.	1890.............	38
do	76	Sub. 3......................	1881.............	188
		Total, Hyde Twp, 657.17 acres.		

WARREN COUNTY

Town	DESCRIPTION	Acres
	ISLANDS IN LAKE GEORGE, *(Original Ownership)*	
Caldwell.....	Dick's (E. of Diamond Island)...........................	.05
Queensbury..	Happy Family (5 in Harris Bay)........................	.47
Bolton.......	Fish Hook (W. of Three Sisters).......................	.02
do	Goose (W. of Long Island).............................	.01
do	Triplets (S. of Whipple Island	.22
do	Whipple (N. of Little Green)...........................	.09
do	Rush (near Moon Bay).................................	.01
do	Colton (near Basin Bay)...............................	
do	Phelps (No. 1, near Buck Mt.).........................	2.08
do	Sweet Briar (in Bolton Bay)............................	.40
do	Refuge (N. of Watch Point)............................	.66
do	Iroquois (in Shelving Rock Bay)........................	.21
do	Perch (in Shelving Rock Bay)..........................	.52
do	Unnamed (S. E. of Perch Island).......................	.06
do	Log Bay Island (in Log Bay)...........................	4.82
do	Huckleberry (in Log Bay)..............................	2.21
do	Hen & Chickens (S. E. of "14 Mile Island")..............	1.74
do	Pine (in Narrows near Tongue Mt.).....................	.47
do	Unnamed (near Pine Island)............................	.15
do	Chingachgook (N. E. of Pine Island)...................	.15
do	Unnamed (3 near Chingachgook)........................	.06
do	Mingoe (E. of Tongue Mountain).......................	.10
do	Ranger (in the Narrows)...............................	.82
do	Ranger Shoal (N. W. of Ranger)........................	.02
do	Mohican ("Phelps" 2 or "Pleasure").....................	5.11
do	Gourd (in the Narrows)................................	.32
do	Unnamed (11 near Gourd, — the "Coup")................	.49
do	Commission..	1.22
do	Unnamed (2 near Commission)..........................	.02
do	Sister Arrow (E. of Commission)........................	.03
do	Arrow..	.01
do	Red Rock Bay Island...................................	.03
do	Round Rock (Artist's Rock)............................	.12
do	Sarah's (Chastine,) near Paradise B).....................	.55
do	Hasel (near Paradise Bay)..............................	1.52
do	Unnamed (E. of Hasel Island)..........................	.04
do	Fox (N. of Paradise Bay)...............................	.19
do	Unnamed (3 near Fox Island)...........................	.01
do	Dollar (near Three Mile Mt)............................	5.76
do	The Sirens (3 near center of lake)......................	.42
do	Unnamed (near the Sirens).............................	.09

WARREN COUNTY

Town	DESCRIPTION	Acres
	ISLANDS IN LAKE GEORGE— (*Continued*)	
Bolton	Halfway (near 5 Mile Mountain)	.62
do	One Tree or Fish (near Black Mt.)	.01
do	Unnamed (2 S. E. of Fish Island)	.01
do	Floating Battery (near Black Mt.)	10.20
do	Unnamed (4 near Floating Battery)	2.13
do	Hatchet (near Floating Battery)	1.92
do	Raggedy (near Hatchet)	.04
do	Duran (near Mother Bunch)	4.60
do	Horicon (near Mother Bunch)	
do	Sagamore (near Mother Bunch)	
do	Mother Bunch (" Isle Lac du Saint Sacrement ")	20.10
do	Steere (W. of Harbor Island)	.46
do	Unnamed (7 near Harbor Island)	3.00
do	Ship (in the Narrows)	.04
do	Juanita (in the Narrows)	2.03
do	Boquet (W. of Juanita Island)	.04
do	Perch (in the Narrows near Tongue Mt.)	.31
do	Bass (in the Narrows near Tongue Mt.)	.02
do	Glen (in the Narrows S. E. of Uncas)	.83
do	Phantom (E. of Uncas Island)	.74
do	Gravelly (in the Narrows)	.94
do	Gem (S. of Big Burnt Island)	.35
do	Little Gem (E. of Gem Island)	.07
do	Uncas (S. W. of Big Burnt Island)	6.54
do	Brush (near Uncas Island)	.36
do	Sunny (near Uncas in the Narrows)	.24
do	Gull Rock (W. of Uncas Island)	.01
do	Little Turtle (N. E. of Turtle)	.03
do	Unnamed (W. of Little Turtle)	.03
do	Unnamed (N. E. of Little Turtle)	.04
do	Hermit (in the Narrows)	.41
do	Manhattan (E. of Hermit)	.01
do	Watch (in the Narrows)	.22
do	Big Burnt (in the Narrows)	30.15
do	Little Harbor (" Kittle," W. of Fork)	4.61
do	As-You-Were (near Tongue Mt.)	.11
do	Little Turtle (near Tongue Mt.)	.10
do	Black Rock (N. of Little Harbor)	.04
do	Fork (in the Narrows)	5.94
Hague	Vicars (S. W. of Hulett's Landing)	7.88
do	Unnamed (2 S. of Vicars Island)	.08
do	Nobles (E. of Vicars Island)	2.06

WARREN COUNTY

Town	DESCRIPTION	Acres
	ISLANDS IN LAKE GEORGE — (*Continued*)	
Hague.......	Unnamed (3 near Noble's Island)........................	.32
do	Gull Rock (near Noble's Island)........................	.01
do	Burgess ("Cooks," S. of Hulett's Landing)................	3.88
do	Unnamed (2 near Burgess Island)........................	.05
do	Hulett's ("Whale," S. of Hulett's Landing)..............	.39
do	Unamed (near Hulett's Island)..........................	.06
do	Narrows (N. of Hulett's)................................	1.00
do	Rabbit Rock (near Narrows Island)......................	.06
do	Rock Dunder (near Meadow Point).......................	.27
do	Loon (near Meadow Point)...............................	.09
do	Unnamed (S. E. of Meadow Point).......................	.03
do	Unnamed (near Rock Dunder)............................	.07
do	Agnes (N. of Meadow Point)............................	4.21
do	Little Gibraltar (near Agnes)............................	.07
do	Summer House Rock (near Agnes).......................	.02
do	Unnamed (5 near Agnes)................................	.29
do	Unnamed (2 N. of Sabbath Day Point).................	.02
do	Delaware ("Watch," N. of Sabbath Day Point)..........	.51
do	Unnamed (near Bass Bay)................................	.02
do	Odell (S. E. of Silver Bay)..............................	1.24
do	Unnamed (near Odell Island)............................	.05
do	Unnamed (4 N. of Uncas dock)..........................	.04
do	Skipper's Jib (N. of Silver Bay)........................	.03
do	Pudding (N. of Silver Bay)..............................	.14
do	Unnamed (N. E. of Pudding Island......................	.01
do	Scotch Bonnet (N. of Silver Bay).......................	.06
do	Mallory (N. E. of Silver Bay)...........................	.75
do	Unnamed (near Mallory Island).........................	.11
do	Gull (E. of Hague).......................................	.13
do	Twin Rock (N. of Gull Island)..........................	.14
do	Waltonian (near Hague).................................	3.13
do	Templenoe ("Watrous," near Hague)...................	1.25
do	Asa's (near Hague).......................................	1.01
do	Flirtation (N. of Waltonian)............................	.66
do	Cook's (4 N. of Waltonian)..............................	.77
do	Unnamed (N. of Waltonian).............................	.04
do	Rock Brothers (E. of Waltonian)........................	.14
do	Unnamed (2 N. of Rock Brothers)......................	.04
do	Juniper (near Rogers Rock).............................	.19
	Total, Islands, 159.96 acres.	

WARREN COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		JESSUP'S 4,100 ACRE PATENT,		
Luzerne	11	Bd. N. & S. by lot line, E. by H. Clemons 50a. & W. by Whitton	1885	98.75
do	11	Clemons H., bd. N. & S. by lot line, E. by John Pier's 50a. & W. by Aldrich's 98¾a. lot	1885 & conveyed 1902	50
		Total, 148.75a.		
		JESSUP'S 7,550A. PATENT		
do	1	Sub. 1	1885	250
do	5	Bd. N. & S. by lot lines, E. by Howe or Home, & W. by Lewis	1881	100
do	5	Sub. 3, 50c. E. & W.; bd. N. & S. by lot lines, E. by a line of marked trees, & W. by a line of marked trees bounds of Coman heirs	1885, '90	75
do	12	E. pt. 96a. bd. W. by Goodness and middle pt. 36a. bd. N. & S. by lot lines, E. by the Newton lot near the foot of Potash Kettle Mt. and W. by Pulver or Putnam	1871 '77, '90	132
		Total, 557 acres.		
		KAYADEROSSERAS PATENT, 23D ALLOTMENT, *Great Lot* 5		
do	3	Bd. N. by Perkins' lot, E. by George Murray, S. by Murray, & W. by Barker or Banker	1881	50
		LUZERNE TRACT,		
do	4		Original	99.50
do	5		Original*	157
do	11		1881, '85	75
do	23	Sub. 3	Original*	65
Caldwell	66		Original	127
Luzerne	94	N. ½	1881	75.75
		Total, 599.25a.		

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* Resale 1899.

WARREN COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		NORTH WEST BAY TRACT		
Bolton	40		Original	175
do	119		1871, '77, '81, '90	182
		Tota, North West Bay Tract, 357 acres.		
		PALMER'S PURCHASE, GENERAL ALLOTMENT,		
Stony Creek	11	All in War. Co.	Conveyed 1905	30
do	12	All in War. Co.	1890, '95	360
do	13	All in War Co.	Appropriated 1919	555.95
do	14	All in Stony Creek	1885, '90	650
Thurman	14	All in Thurman	1885, '90	245
Stony Creek	16	All in War. Co	1885, 90	265
do	17	All in War. Co	1895	542
do	18	All in War Co.	Purchase 1918	810.50
do	19	All in Stony Creek	Purchase 1893	1,018
do	20	Ex. 110a. Middle part on E. Stony Creek	1885, '90	938
do	21	Ex. 50a. res. land assessed to T. Burgess, S. of E. Stony Creek on W. line of lot	1885, 1890	998
do	22		Pur. 1918 & '85, '90	1,048
do	23		Pur. 1918 & '85 ,'90	1,048
do	30	All in Stony Creek	1885, '90	49
do	31	All in Stony Creek	1885, '90	70
do	32	All in Stony Creek	1895, '00	78
do	33	All in Stony Creek	1895, '00	156
do	34	All in Stony Creek	1895, '00	240
do	35	All in Stony Creek	1895, '00	300
do	36	All in Stony Creek	1895, '00	360
		Total, 9,761.45a.		
		PALMER'S PURCHASE, MIDDLE DIVISION, GREAT LOT 1,		
do	...	All ex. 100a. in the S. E. cor.; sub. 4, 100a. deeded Hollis Russell to Joseph L. Fuller; subs. 5 and 6, 55a., more or less deeded Columbus Gill to Chas. W. Murray, beg. at a hemlock tree on the S. line of lot (or sub.) 7 being the S. E.		

WARREN COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		PALMER'S PURCHASE, MIDDLE DIVISION, GREAT LOT 1—*(Continued)*		
Stony Creek..	...	cor. of Jas. Ackley, th. S. 26 deg. 30 min. E. 39c. to a beech tree on N. line of lot (or sub.) 4, th. S. 63 deg. 30 min. W. along line of said lot (or sub.) 4, 14c. to a stake and stones, th. N. 26 deg. 30 min. W. 39c. to a stake and stones in the S. line of lot (or sub.) 7, th. N 63½ deg. E. to beg; subs. 5 and 6, 55a. deeded, Columbus Gill to Sylvester McDonald beg. at the S. W. cor. of lot (or sub.) 7 and th. N. 63½ deg. E. 14c. and 37l. to a stake and stones, th. S. 26 deg. 30 min. E. 39c. to a stake on N. line of lot (or sub) 4, th. S. 63 deg. 30 min. W. 14c. to a stake on the W. line of lot No. 1, th. N. 26½ deg W. to beg; sub. 7, 104½a. deeded by Geo. T. Rockwell to Lyman T. Fuller and another; sub. 8, 25⅕a. beg. at Jas. Ackley's N. W. cor. and runs th. N. 27½ deg. W. 9c. to a maple tree, th. N. 61½ deg. E. 28c. to the E. line of the sub., th. S. 28½ deg. E. 9c. to the S. line of the sub., th. S. 61½ deg. W. 28c. to beg..........	Purchase 1897....	605
		GREAT LOT 2, EAST PART,		
do ..	...	All b'd. E. by Great Lot 1, W. by W'ly part of Great Lot 2 known as "Bruce Lot" or Douglas survey, S. by Saratoga Co. and N. by land formerly of Dr. Patterson, except		

WARREN COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		PALMER'S PURCHASE, MIDDLE DIVISION, GREAT LOT 2, EAST PART — (*Continued*)		
Stony Creek..	...	163a. conveyed to John Bailey beg. on line of lots 1 and 2 where line crosses Lens Lake Creek, th. up said creek as it winds and turns to an Elm tree near the saw mill, th. S. 78 deg. W. 36c. to lake near the dam th. N'ly along flow as it winds and turns to a small creek, th. up creek to a spruce tree marked 10 and 29, th. N. 51 deg. E. to lot 1, th. S. 30 deg. E. (in 1784) 40c. to beg; 100 acres more or less conveyed to Albro Tripp, beg. at the N. E. cor. of lot 3, sub. of Great Lot 2, th. S. 28 deg. 30 min. E. 40c. to a stake and stones for a cor., th. N. 28 deg. 30 min. E. 25c. to a spruce tree, th. N. 28 deg. 30 min. 40c. to a hemlock tree, th. S. 58 deg. 30 min. 25c. to beg.; 100 acres more or less conveyed to Henry Tripp (supposed to be described in deed to Thos. H. Tripp, dated Oct. 4, 1861) known as sub. 1; 100 acres conveyed to Joseph E. Fuller, beg. at the N. W. cor. of lot or sub. 2, of Great Lot 2, th. S. 28 deg. 30 min. E. 40c. to a spruce tree, th. N. 58 deg. 30 min. 25c. to a stake and stones for a cor., th. N. 28 deg. 30 min. W. 40c. to a spruce tree th. S. 58 deg. 30 min. W. 25c. to beg.; 50 acres agreed to be conveyed to R. Welch and A. Clements; 46 acres sold to James H. Fuller		

WARREN COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		PALMER'S PURCHASE, MIDDLE DIVISION GREAT LOT 2, EAST PART — (*Continued*)		
Stony Creek..	...	about the year 1877, known as lot or sub. 4 and a piece of land near the saw mill supposed to contain 11 acres, deeded to Wm. H. Millis or Miles by Columbus Gill in 1881.......	Purchase 1897....	860
		WEST PART, BRUCE TRACT (*James Green Survey*)		
do	1	....	1895, '00.........	102
do ..	2	....	1895, '00.........	102
do ..	3	....	1895, '00.........	102
do ..	4	....	1895, '00.........	102
do ..	5	....	1895, '00.........	102
do ..	6	....	1895, '00.........	102
do ..	7	....	1895, '00.........	102
do ..	8	....	1895, '00.........	102
do ..	9	....	1895, '00.........	103
do ..	10	....	1895, '00.........	103
do ..	11	....	1895, '00.........	103
do ..	12	....	1895, '00.........	103
do ..	13	....	1895, '00.........	103
do ..	15	All in Warren Co.............	1895.............	52
do ..	16	All in Warren Co.............	1895.............	96
		GREAT LOT 3, (*Green's Survey*)		
do ..	3	....	Conveyed 1902....	100
do ..	4	....	Conveyed 1902....	100
do ..	5	....	Conveyed 1902....	100
do ..	8	....	Conveyed 1902 & purchase 1904...	100
do ..	9	....	1895, 00.........	100
do ..	10	....	1895, '00.........	100
do ..	11	....	1895, '00.........	98.75
do ..	12	Ex. $3\frac{75}{100}$ a. being a strip of land 4r. in width across the lot.....	1895, 1900........	96.29
do ..	13	Ex. $2\frac{88}{100}$ a. being a strip o land 4r. wide, across lot..........	1895, '00.........	97.17

WARREN COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		PALMER'S PURCHASE, MIDDLE DIVISION, GREAT LOT 3 — *Green's Survey* — (*Continued*)		
Stony Creek..	14	Ex. $3\frac{7}{10}$ a., being a strip of land 4 rods wide across lot........	1895, '00.........	99.30
do ..	15	....	1895, '00.........	100
do ..	16	....	1895, '00.........	98.30
do ..	17	....	1895, '00.........	100
do ..	18	....	1895, '00.........	100
do ..	19	Ex. $3\frac{73}{100}$ a., being a strip of land 4r. wide across lot...........	1895, '00.........	96.27
do ..	20	....	1895, '00.........	100
do ..	21	All in Warren Co.............	1895, '00.........	21
do ..	22	All in Warren Co.............	1895, '00.........	51
do ..	23	All in Warren Co.............	1895, '00.........	80
do ..	24	Ex. $4\frac{12}{100}$ a., being a strip of land 4r. wide across lot...........	1895, '00.........	95.88
do ..	25	....	1895, '00.........	100
		Total, Middle Division, Pal. Pur., 4,877.92a.		
		PALMER'S PURCHASE, REAR DIVISION, *Great Lot* 1,		
do .	1	....	Purchase 1899....	160
do ..	2	....	Purchase 1899....	160
do ..	3	....	Purchase 1899....	160
do ..	4	....	Purchase 1899....	80
do ..	26	....	Purchase 1899....	160
do ..	27	....	1877, '81, '85, '95..	160
do ..	34	....	1877, '81, '85.....	160
do ..	35	....	1881, '85, '90.....	160
do ..	37	....	1881, '85, '90, '95..	122
do ..	38	....	1881, '85, '90.....	160
do ..	39	....	1885.............	160
do ..	40	....	Purchase 1897....	80
do ..	46	All in Stony Creek............	1885.............	135.53
do ..	49	All in Stony Creek............	Purchase 1897....	98.77
Thurman....	49	All in Thurman..............	Purchase 1897....	10.23
do	58	....	Purchase 1897....	160
do	59	....	1881, '85.........	160
do	60	....	1881, '90.........	160
do	61	....	1871, '77, '81.....	96
do	62	....	1890.............	160

WARREN COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		PALMER'S PURCHASE, REAR DIVISION, GREAT LOT 1 — (*Continued*)		
Thurman	63	S. ½	1871, '77, '81, '90	80
do	64		1871, '77, '81	80
do	69		1871, '77, '81	80
do	70		1881, '85	160
do	74		Purchase 1897	160
do	75		1890	160
do	76		Purchase 1905	80
do	81		Purchase 1897	80
do	82		1895	160
do	83		1890, '95	160
do	85		1877, '81, '85	58
do	86		1871, '77, '81	144
do	87		Purchase 1907	160
do	88		Purchase 1897	72
		Total, Great Lot 1, 4,336.53 acres.		
		REAR DIVISION, *Great Lot* 2,		
Stony Creek	3		1890, '95	125.60
do	4		1890, '95	125.60
do	5		1890, '95	125.60
do	6		1890, '95	125.60
do	7		1890, '95	125.60
do	8		1890, '95	125.60
do	9		1890, '95	125.60
do	10		1890, '95	125.60
do	11		1890, '95	125.60
do	12		1890, '95	125.60
do	13		1890, '95	125.60
do	14	All in Stony Creek	1890, '95	101.60
Thurman	14	All in Thurman	1890, '95	24
Stony Creek	15	All in Stony Creek	1890, '95	9.60
Thurman	15	All in Thurman	1890, '95	116
do	16		1890, '95	125.60
do	17		1890, '95	125.60
do	18		1890, '95	125.60
do	19		1890, '95	125.60
do	20		1871, '81, '85	150.70
do	21		1871, '81, '85	150.70
do	22		1890, 95	125.60

WARREN COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		PALMER'S PURCHASE, REAR DIVISION, GREAT LOT 2 — (*Continued*)		
Thurman	23		1890, '95	125.60
do	24		1890, '95	125.60
do	25		1890, '95	125.60
do	26		1890, '95	125.60
Stony Creek	27	All in Stony Creek	1890	3
Thurman	27	All in Thurman	1871,'81,'85,'90,'95.	122.60
Stony Creek	28	All in Stony Creek	1890, '95	93.60
Thurman	28	All in Thurman	1890, '95	32
Stony Creek	29		1890, '95	125.60
do	30		1890, '95	125.60
do	31		1890, '95	125.60
do	32		1890, '95	125.60
do	33		1890, '95	125.60
do	34		1890, '95	125 60
do	35		1890, '95	125.60
do	36		1890, '95	125.60
do	37		1890, '95	125.60
do	38		1890, '95	125.60
do	43		1890, '95	125.60
do	44		1890, '95	125.60
do	45		1890, '95	125.60
do	46		1890, '95	125 60
do	47		1890, '95	125.60
do	48		1890, '95	125.60
do	49		1890, '95	125.60
do	50		1890, '95	125.60
do	51		1890, '95	125.60
do	52	All in Stony Creek	1890	70.60
Thurman	52	N. E. cor. in Thurman	1890, '95	25
Stony Creek	53	All in Stony Creek	1890	1
Thurman	53	W. end in Thurman	1890, '95, '00	49.60
do	54		1871,'81,'85,'90,'95.	125.60
do	55		1871, '81, '85	125.60
do	56		1871, '81, '85	125.60
do	57		1890, '95	125 60
do	58		1890, '95	125.60
do	59		1871,'81,'85,'90,'95.	125.60
do	60		1871, '81, '85	150.70
		Total, Great Lot 2, 6,753.60 acres.		

WARREN COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		PALMER'S PURCHASE, REAR DIVISION — (*Continued*) *Great Lot* 3,		
Stony Creek..	.....	All in Stony Creek, 3,914a. ex. 563a. S'ly end thereof and ex. 200a. in 1,575a. S'ly end, bd. beg. at a stake and stones the N. W. end of the Mill lot, running N. 26° W. 44c. 73l., th. N. 26° E. 44c. 73l. to S. line of lot, th. S. 64° W. along said line 44c. 73l. to beg......	1890, '95, '00 and conveyed 1905..	3,151
Thurman....	.....	All in Thurman...............	1890, '95.........	1,400
		Total, Great Lot 3, 4,551 acres.		
		Great Lot 4,		
do	HTP	All in Thurman...............	Pur. 1897 & 1900..	274
Stony Creek..	HTP	All in Stony Creek.............	Pur. 1897 & 1900..	302
		Total 576 acres.		
		RIVER DIVISION, *Great Lot* 3		
do ..	.....	N. E. cor. bd. N. by Middle Div., E. by Sub. 1, S. by Saratoga Co., and W. by lot 4..	1877.............	45
		TONGUE MOUNTAIN TRACT,		
Bolton......	6	....	Original, resale 1859...........	168
Hague.......	35	All in Hague..................	1900.............	65
do	44	....	Original, resale 1859...........	212
do	46	....	Original, resale 1867...........	155
do	48	....	Original, resale 1859...........	273
do	49	....	Original, resale 1859...........	270
		Total, 1,143 acres.		

WARREN COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		TOTTEN & CROSSFIELD PURCHASE, TOWNSHIP 10, (ALLOTMENT IN TOWNSHIPS 10 AND 29)		
Thurman....	15	All in Warren Co.............	Purchase 1896....	62.80
		TOTTEN & CROSSFIELD PURCHASE, TOWNSHIP 11		
Johnsburgh..	11	All in Johnsburgh.............	Purchase 1897....	277
Thurman....	11	All in Thurman...............	1877, '85.........	23
do	12	All in Thurman...............	1885, '90.........	48
Johnsburgh..	12	All in Johnsburgh.............	Purchase 1897....	102
do ..	13	....	1885, '90.........	150
do ..	14	....	1877, '81, '85 & purchase 1897...	300
do ..	15	....	1877, '81, '85.....	300
do ..	16	....	1877, '81, '85.....	300
do ..	17	....	1885, '81.........	300
do ..	18	....	1881, '81.........	300
do ..	19	....	1885, '81.........	300
do ..	20	....	1885, '81.........	300
do ..	21	....	1885, '81.........	300
do ..	22	....	1885, '81.........	300
do ..	27	S. W. part................	1895, '00.........	150
do ..	28	....	1885, '81.........	300
do ..	29	....	1885, '81.........	300
do ..	30	....	1877, '81, '85.....	300
do ..	31	....	1877, '81, '85.....	300
do ..	32	....	1877, 81, '85.....	300
do ..	33	....	Purchase 1895....	300
do ..	34	....	1877, '81, '85... .	300
do ..	35	....	Pur. 1895 & 1900..	300
do ..	36	....	Purchase 1895....	150
do ..	37	....	Purchase 1895 & 1877, '81, '85, '95...........	150
do ..	38	....	Purchase 1897....	300
do ..	39	....	1877, '81.........	300
do ..	40	....	1877, '81.........	300
do ..	42	....	Purchase 1897....	300
do ..	44	N. end.....................	1877, '81, '85.....	150
do ..	45	N. end.....................	1877, '81.........	150
do ..	46	N. end.....................	1877, '81, '95.....	98
do ..	56	....	1877, '81, '85.....	300

WARREN COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		TOTTEN & CROSSFIELD PURCHASE, TOWNSHIP 11 — (*Continued*)		
Johnsburgh	57		1885, '90	300
do	58		1881, '85	300
do	59		1877, '81, '85	300
do	60		1881, '85	150
do	61		1885, '90, '95	150
do	62		1885, '90, '95	300
do	63		1885, '90, '95	300
do	64		1885, '90, '95	300
do	81		Purchase 1897	300
do	82		Purchase 1897	300
do	83		Pur. 1898 & 1900	300
do	84		Pur. 1898 & 1900	150
		Total, 11,198 acres.		
		TOTTEN & CROSSFIELD PURCHASE, TOWNSHIP 12,		
do	60		1881, '85	166
do	134	S. E. cor. 12½c. E. & W. & 24c. N. & S	1885	30
do	135	N. W. pt. 60a. ex. 36a. N. W. cor. thereof 24c. N. & S. & 15c. E. & W	1885	24
		Total, 220 acres.		
		TOTTEN & CROSSFIELD PURCHASE, TOWNSHIP 13,		
do		Gore (unalloted) N. W'ly end in Warren Co	Purchase 1905 & Conveyed 1909	1,901.66
do	3		1877, '90	235
do	4		Pur. 1905 & 1910	256
do	5		Pur. 1905 & 1910	297
do	6		Pur. 1905 & 1910	241.10
do	7		Pur. 1905 & 1910	272
do	8		Pur. 1905 & 1910	246.60
do	9		1885, '90	233
do	10		1877, '85	258
do	11		1877 '85	244.80
do	12		1877, '85	232.75
do	14		Purchase & 1910	141.40
do	15		1885, '90	145.90
do	16		Pur. 1905 & 1910	134.80

WARREN COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		TOTTEN & CROSSFIELD PURCHASE, TOWNSHIP 13 — (*Continued*)		
Johnsburgh..	17	....	Pur. 1905 & 1910..	137.60
do ..	18	....	Pur. 1905 & 1910..	154
do ..	19	....	Pur. 1905 & 1910..	135 [illegible]
do ..	20	....	Pur. 1905 & 1910..	165.20
do ..	21	....	Pur. 1905 & 1910..	143.40
do ..	22	....	1877, '85.........	131.90
do ..	23	....	1885, '90, '95.....	127.75
do ..	26	....	1885, '90.........	145.20
do ..	27	....	1885, '90, '95.....	151.10
do ..	28	....	Pur. 1905 & 1910..	164.50
do ..	29	....	Pur. 1905 & 1910..	187.10
do ..	30	....	Pur. 1905 & 1910..	152.50
do ..	31	....	Purchase 1905....	174.30
do ..	32	....	Pur. 1905 & 1910..	155 [illegible]
do ..	33	....	Purchase 1905....	152.40
do ..	34	....	Purchase 1905....	163.60
do ..	35	....	Pur. 1905 & 1910..	157.50
do ..	36	....	1885, '90.........	152.40
do ..	37	....	1885, '90.........	148.30
do ..	38	....	1885, '90.........	151.70
do ..	39	....	Purchase 1905....	157.20
do ..	40	....	Purchase 1905....	146.50
do ..	41	....	Pur. 1905 & 1910..	147.40
do ..	42	....	Pur. 1905 & 1910..	165.25
do ..	43	....	Purchase 1899....	143.25
do ..	44	....	Purchase 1899....	174.75
do ..	45	....	Purchase 1899....	156.10
do ..	46	....	Purchase 1899....	140.30
do ..	47	....	Purchase 1899....	134.20
do ..	48	....	Purchase 1899....	122.60
do ..	49	....	1877, '85.........	122.60
do ..	50	....	1885, '90.........	146.90
do ..	51	....	Purchase 1899....	154.30
do ..	52	....	Purchase 1899....	169
do ..	53	....	Purchase 1899....	187.80
do ..	54	....	Purchase 1899....	153
do ..	55	....	Pur. 1905 & 1910..	175.30
do ..	56	....	Pur. 1905 & 1910..	155.50
do ..	57	....	Pur. 1905 & 1910..	154.60
do ..	58	....	Pur. 1905 & 1910..	163.80
do ..	59	....	1885, '90.........	155.90
do ..	60	....	1885, '90, '95.....	152.50

WARREN COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		TOTTEN & CROSSFIELD PURCHASE, TOWNSHIP 13 — (*Continued*)		
Johnsburgh	61		1885, '90	118.20
do	62		Pur. 1905 & 1910	119.80
do	63		Pur. 1905 & 1910	125.50
do	64		Purchase 1899	118.40
do	65		Purchase 1899	117.80
do	66		Purchase 1899	132.80
do	67		Purchase 1899	114.40
do	68		1885, '90	140.70
do	69		1885, '90	126.30
do	70		1885, 90	115.80
do	71		1885, '90	107.60
do	72		1885, '90	118.30
do	73		1885, 90	136.80
do	74		1885, '90	122.75
do	75		1885, '90	131.80
do	76		Purchase 1899	146.30
do	77		Purchase 1899	161.30
do	78		Purchase 1899	142.40
do	80		1885, '90	137.70
do	81		Pur. 1905 & 1910	139.75
do	82		Pur. 1905 & 1910	147.90
do	83		Pur. 1905 & 1910	140.30
do	84		1885, '90	140.60
do	85		1885, '90	152.60
do	86		Pur. 1905 & 1910	153.40
do	87		Pur. 1905 & 1910	161.90
do	88		Pur. 1905 & 1910	154.50
do	89		1885, '90	151.90
do	90		1885, '90	171.80
do	91		Purchase 1899	147.50
do	92		Purchase 1899	179.80
do	93		Purchase 1899	165.70
do	94		Purchase 1899	149.50
do	95		1885, '90	138.70
do	96		1885, '90	157.60
do	97		Purchase 1899	178.20
do	98		Purchase 1899	153.70
do	99		Purchase 1899	152.20
do	100		Purchase 1899	186.10
do	101		1877, '85	200
do	102		Purchase 1899	163.80
do	103		Purchase 1899	192.30

WARREN COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		TOTTEN & CROSSFIELD PURCHASE, TOWNSHIP 13 — (*Continued*)		
Johnsburgh	104		Purchase 1899	169.80
do	105		Purchase 1899	174.20
do	106		1885, '90	181.50
do	107		1885, '90	171
do	108		1885, '90	171.75
do	109		1885, '90	149.00
do	110		1885, '90	147.40
do	111		1885, '90	156
do	112		Purchase 1899	149.60
do	113		Purchase 1899	143.80
do	114		Purchase 1899	162.10
do	115		Purchase 1899	136.75
do	116		1877, '85	165.80
do	117		Purchase 1899	158.50
do	118		1885, '90	137
do	119		Purchase 1899	123.75
do	120		Purchase 1899	146.75
do	121		1877, '85	167.30
do	122		1877, '85	138.50
do	123		1877, '85	154
do	124		1877, '85	173.60
do	125		1877, '85	184.10
do	126		Purchase 1899	152
do	127		Purchase 1899	181.10
do	128		Purchase 1899	159.25
do	129		1885, 90	168.75
do	130		1885, '90	174.60
do	131		1885, '90	164.25
do	132		1885, '90	167.50
do	133		1885, '90	111.30
do	134		1885, '90	110.10
do	135		1885, '90	118.90
do	136		1885, '90	116
do	137		Purchase 1899	112.20
do	138		Purchase 1899	128.60
do	139		Purchase 1899	108.90
do	140		1877, '85	134
do	141		1877, '85	130
do	142		1877, '85	115.70
do	143		1877, '85	104.75
do	144		1877, '85	125.80
		Total, 23,420.11 acres.		

WARREN COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		TOTTEN & CROSSFIELD PURCHASE — (*Continued*) TOWNSHIP 14, *North ½ and South East ¼,* (*Pond's Survey*)		
Johnsburgh..	50	....	1877, '81, '85.....	160
do ..	51	....	1877, '81, '85....	160
do ..	99	S. W. cor.....................	1877, '81, '85.....	33
do ..	106	All in Warren Co..............	1881, '85.........	132
		South West ¼ *Conklin & Others' Tract* (*Leggett's Survey*)		
do ..	6	Ex. 20a. N. W. cor............	1895.............	130
do ..	13	....	Pur. 1908 & 1910..	150
do ..	14	....	1881 '85.........	150
do ..	22	....	1877, '81, '85.....	112.50
do ..	24	....	1877, '81.........	178
do ..	25	....	1877, '81, '85.....	178
		Total, 1,383.50 acres.		
		TOTTEN & CROSSFIELD PURCHASE, TOWNSHIP 15,		
do ..	103	All in Warren Co..............	1895, '00 & purchase 1897......	100
do ..	104	All in Warren Co..............	Pur. 1897 & 1895..	40
do ..	113	All in Warren Co..............	Purchase 1897	125
do ..	114	....	Purchase 1908, '16.	160
do ..	115	All in Warren Co..............	Pur. 1897 & 1895..	120
do ..	116	All in Warren Co..............	Pur. 1897 & '85, '90............	40
do ..	123	All in Warren Co..............	1895, '00 & purchase 1897......	30
do ..	124	All in Warren Co..............	1895, '00 & purchase 1897......	120
do ..	125	....	1895, '00 & purchase 1897......	160
do ..	126	....	1895, '00 & purchase 1897.. ...	160
do ..	127	....	1895, '00 & purchase 1897......	160
do ..	128	....	Purchase 1897....	160

WARREN COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		TOTTEN & CROSSFIELD PURCHASE, TOWNSHIP 15 — (*Continued*)		
Johnsburgh..	129	All in Warren Co..............	Purchase 1897....	80
do ..	135	All in Warren Co..............	Purchase 1897....	10
do ..	136	All in Warren Co..............	Purchase 1897....	150
do ..	137	....	1895, '00 & purchase 1897......	160
do ..	138	....	1895, '00 & purchase 1897......	160
do ..	139	....	1895, '00 & purchase 1897......	160
do ..	140	....	1895, '00 & purchase 1897......	160
do ..	141	....	1895, '00 & pur chase 1897......	160
do ..	142	....	1895, '00 & purchase 1897......	160
do ..	143	All in Warren Co..............	1895 '00 & purchase 1897......	80
do ..	144	All in Warren Co..............	1895, '00 & purchase 1897......	10
do ..	145	All in Warren Co..............	1895, '00 & purchase 1897......	210
do ..	146	....	1895, '00 & purchase 1897......	220
do ..	147	....	1895, '00 & purchase 1897......	220
do ..	148	....	1895, '00 & purchase 1897......	220
do ..	149	....	1895, '00 & purchase 1897......	220
do ..	150	....	1895, '00 & purchase 1897......	220
do ..	151	....	1895, '00 & purchase 1897......	220
do ..	152	....	1895, '00 & purchase 1897......	220
do ..	153	....	1895, '00 & purchase 1897......	220
do ..	154	All in Warren Co..............	Purchase 1897....	140
		Total, 4,775 a.		

WARREN COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		TOTTEN & CROSSFIELD PURCHASE, — (*Continued*) TOWNSHIP 24		
Chester	18	N. pt	1877, '81, '85	300
Johnsburgh	24		1881, '85, '90	420
do	25		1877, '85, '95	420
Chester	29	Sub. 12, N. E. pt	1877	16
		Total, 1,156 acres.		
		TOTTEN & CROSSFIELD PURCHASE, TOWNSHIP 29, *Allotment in Townships* 10 *and* 29		
Thurman	16	All in Warren Co. ex. Drake	Purchase 1896	735.84
do	17	All in Warren Co	Purchase 1896	1,328.34
do	18	All in Warren Co	Purchase 1896	1,370.75
Johnsburgh	19	All in Johnsburgh	Purchase 1896	26.23
Thurman	19	All in Thurman	Purchase 1896	1,396.41
Johnsburgh	20	All in Johnsburgh	Purchase 1896	315
Thurman	20	All in Thurman	Purchase 1896	1,104.80
		Russell Tract		
Johnsburgh	.....	Bd N'ly by line parallel to and 44c N'ly from lot 20, E'ly 44c. by Township line, S'ly 80c by lot 20, and W' y 44c. by a line 80c. from E. line of Township	1885, '90, '95	352
do	.....	On E'ly line of Township 44¼c. S'ly from N'ly line 129¾c. long N. and S. and 80c. wide E. and W. bd. N'ly by the Hopkins lot, and S'ly by the G. R. Martin lot	Purchase 1898 & 1885, 1890	1,038
do	.....	N. E. cor. 41c. 25l. wide N. & S., & 80c. long E. & W	Purchase 1896	330
do	.....	On E. line of Township 191¼c. S'ly from N'ly line, 15c. wide N'ly & S'ly & 80c. long E'ly & W'ly	Pur. 1899 & 1900	120
do	.....	On S. line of Balfour and Rutherford Tracts 80c. W. from E line of township, 10c. 26l. wide on E. and 10c. 67l. on W. line	1885	125.50

WARREN COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		TOTTEN & CROSSFIELD PURCHASE, TOWNSHIP 29 — (*Continued*) UNALLOTTED,		
Johnsburgh..	.....	All of unallotted pt. of Township 29 in Johnsburgh, except 2,400a. E'ly end of the Rutherford Tract, 80c. wide E. & W.; 176⅙a. bd. N. by the Sacandaga River, E'ly by a line parallel with and 80c. W. from E. line of Township and S. by the S. line of the Rutherford Tract; 116a. known as the Benj. Harrington farm, b'd. E. by said 176⅙a. parcel; 64a. being all of 125⅓a. on S. line of the Rutherford Tract, 80c. W. from E. line of Township, 10c. 26l. wide on E. and 10c. 67l. on W. line not covered by said 176⅙a. and 116a. parcels..	Purchase 1892, '96 and 1890.......	8,517.84
Thurman....	.....	All that pt. of 1,430a. in N. W. cor. of Thurman, bd. N. by Johnsburgh, S. E'ly by N'ly line of numbered lots and W'ly by Hamilton County.........	1853, '81, '85, '90 & conveyed 1905..	702.67
do	.....	S. E. cor. bd. N. by town line & W.. by lot 20...............	Purchase 1896....	1,129.90
		Total, Twp. 29, T. & C. P., 18,593.28a.		
		TOTTEN & CROSSFIELD PURCHASE, TOWNSHIP 31,		
Johnsburgh..	.....	All in Warren Co..............	1885, '90.........	3,476.60
		WARRENSBURGH TRACT,		
Warrensburgh	3	....	Original & resale 1867...........	201
do	7	....	Original & resale 1899...........	214
do	10	....	Original & resale 1899...........	214
do	14	....	Original & resale 1899...........	200
		Total, 829 acres.		

WARREN COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		WATERS		
....	.....	Hudson River. All S. of Hyde Twp. ex. so much as is within Kayaderosseras Patent.......	Original..........	....
....	.....	Sacandaga River. All E. of Livingston Patent...........	Original..........	....
....	.....	Schroon Lake. All in Warren Co........................	Original..........	2,136
....	.....	Lake George. All S. of Essex Co........................	Original..........	26,482
		Total, 28,618 acres.		

WASHINGTON COUNTY

(*Total number of acres*, 4,337.)

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		Argyle Patent,		
Fort Edward	138	Carter, Cyrus; on N. line 19 rods E'ly from N. W. corner	1915	2.00
		Easton, Town of,		
Easton	...	Bd. N. by J. Wetsell, E. by Thos. Berry & S. & W. by Wm. Weed or lands of Jacob Hil	1877, '81, '85	23
do		Campbell, Mrs. John; bd. N. by lands of Henry Waters	1915	15
		Total 38 acres.		
		Granville, Town of,		
Granville	...	Bd. E. by Lansing Day's estate, S. by highway and W. by A. W. Tupper	1881	1
do	...	Potter, Anna, estate of, bd. N. by Thos. Clark, E. by Chas. Savage & highway to Hampton, & S. & W. by O. J. Merrill	1885	3
		Total, 4 acres.		
		Hebron, Town of,		
Hebron	...	Bd. N. by Sherman, E. by Boyington, S. by Sherman, & W. by James Elate	1877	15
		South Bay Tract,		
Dresden	50		1881, '85, '95	120
do	58		Original & resale 1833	57
do	90		1877, '81	160
do	91		1877, '81, '85, '90	160
do	98		1885	160
do	109		Original & resale 1899	103
Fort Ann	122		Original & resale 1867	160
Dresden	157		1885	122
		Total, 1,042 acres.		

WASHINGTON COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		WESTFIELD TRACT,		
Fort Ann....	36	....	Original & resale 1861...........	160
do	46	....	Original*.........	160
do	49	....	Original*.........	160
do	50	....	Original*.........	160
do	54	....	Original*.........	160
do	56	....	Original*.........	160
		Total, 960 acres.		
		WILLIAM'S NORTH TRACT,		
Dresden.....	61	....	1890.............	100
		WATERS,		
		Hudson River, All in Washington Co., ex. so much as is within Saratoga Pat................	Original..........	....
		Lake Champlain, All in Washington Co..................	Original..........	2,176

* Resale, 1899.

CATSKILL PRESERVE

DELAWARE COUNTY

(*Total number of acres,* 11,513.63.)

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		BABINGTON PATENT,		
Walton......	10	....	1853.............	108
do	11	S. W. ½......................	1853.............	54
		Total, 162 acres.		
		EVANS' PATENT,		
Tompkins....	29	Sub. 6......................	Mortgage, 1826...	200
		FITCH'S (JONATHAN) PATENT,		
Davenport...	10	....	1895, '00.........	200
		HARDENBURGH PATENT, GREAT LOT 2, *Division* 28		
Hancock.....	1	S. pt. bd. N. by lands of Cyrus Peak......................	1881, '85.........	390
do	2	S. pt. bd. N. by lands of Cyrus Peak......................	1881, '85.........	400
		Division 29, *East* ½,		
do	1	Ex. right of way of R. R.......	1881, '85.........	125
do	4	S. ½........................	1881, '85.........	67.50
		West ½,		
do	2	....	1885, '90.........	170
		Total, Great Lot 2, 1,152.50 acres.		
		HARDENBURGH PATENT, GREAT LOT 3, *South Part, Jacob R. Hardenburgh Tract, Division* 3,		
Hancock.....	12	....	1871.............	76
do	16	....	1871, '77.........	67
do	17	....	1871, '77.........	67
do	20	....	1871, '77.........	67
do	21	....	1871, '77.........	67

DELAWARE COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		HARDENBURGH PATENT, GREAT LOT 3, *South Part, Jacob R. Hardenburgh Tract*—(*Continued*) 10,000 acre tract, *Division* 3,		
Hancock.....	34	....	1895, '00.........	69.50
do	35	....	1895, '00.........	69.50
do	36	....	1895, '00.........	69.50
do	37	....	1895, '00.........	69.50
		Total, Great Lot 3, 622 acres.		
		GREAT LOT 4, *Ray Tract*,		
Colchester...	39	Ex. 40a. N. W. cor............	1871, '77, '81.....	115
do	57	S. ½ bd. N. by Bell..........	1895, '00.........	80
do	73	All in Colchester.............	1877, '85.........	50
do	78	....	1877.............	160
do	80	Bd. N. E. by lot 72, S. E. by county line & W. by Francisco	1890, '95.........	28.86
do	87	All in Delaware Co............	1877.............	75
		Spooner Tract,		
Hancock.....	34	All in Hancock...............	1877, '81.........	50
		Total, Great Lot 4, 558.86 acres.		
		HARDENBURGH PATENT, GREAT LOT 5,		
Colchester...	18	Bd. N. by Francisco, E. by Warren & Bogart, S. by lot 17 & W. by Brainerd or Brainard & D. Francisco..................	1877.............	38
do	80	S. pt. bd. N. by Smith.........	1885.............	113
do	98	S. W. pt. N. & E. by lands of A. Campbell, & E. B. Bradley, 165a., ex. 15a. bd. N. by Campbell & Bradley & W. by Campbell, E. by Miller & S. by Reid	1885.............	150
do	120	S. or S'ly pt. bd. N. or N'ly by Buckley or Bulkley..........	1877, '81.........	30
do	156	....	1877, '81.........	84
do	314	N. E. pt. bd. S'ly by land of Holmes, Brown & Brown....	1885.............	91

Delaware County

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		Hardenburgh Patent, Great Lot 5 — (*Continued*)		
Colchester	329	S. E'ly cor bd. N'ly by Wm. Finch & W'ly by J. or Wm. Brock	1877, '81, '85	110
do	336	Ex. 55a. N E. cor	1885	105
do	338		1877, '81, '85	160
do	374		1877, '81, '85	168
do	375		1877, '81	172
do	376		1877, '81, '85	150
do	377		1877, '81, '85	150
do	379	Ex. 20a. S. or S'ly cor	1877, '81	130
do	380	Ex. 25a. S'ly cor. sold to Reagan	1877	140
do	386	Ex. 10a. S. or S'ly cor	1877, '81	150
do	388		1877, '81, '85	153
do	390		1877, '81	181
		Total, Great Lot 5, 2,275 acres.		
		Great Lot 6, Division 3, (*Robinson Tract*)		
Andes	14		1871, '77	130
do	20		Pur. 1906 & 1910	136
do	21		1871, '77, '85	133
do	26		1877	129
do	37		1877, '81, '85	153
do	44		1871, '77, '81, '85	136
do	50		1877, '81, '85, '95	136
do	53	N. W. cor	1871	5
do	57		1877	153
do	77		1871, '77, '81	136
do	78		1871, '77, '81, '85	142
do	79		Purchase 1907	142
do	99	N. W'ly cor. 22c. 70l. long N'ly and S'ly, and 22c. 36l. wide E'ly and W'ly	1885, '90	50
do	106		1871, '90	132
do	114		1877, '81, '85, '85	167
do	139		1871, '77, '81	164
do	140		1871, '77, '85, '90 & conveyed 1917	161
		Total, Great Lot 6, 2,205 acres.		

DELAWARE COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		HARDENBURGH PATENT — (*Continued*) GREAT LOT 7, *Garretson Tract,*		
Middletown..	69	....	Pur. 1906, '09 & 1905, '10.......	160
do ..	70	....	1881, '85.........	160
do ..	71	....	1853.............	160
do ..	72	....	1853, '85.........	145
do ..	79	....	Purchase 1904....	56.50
do ..	82	....	1853, '81.........	161
do ..	84	....	1871, '90.........	165
do ..	109	All in Delaware Co............	1871, '90.........	30
do ..	110	....	Purchase 1906....	160
do ..	114	W. ½........................	Purchase 1904....	80
		Total, Great Lot 7, 1,277.50 acres.		
		GREAT LOTS 7 AND 10, *Darling's First Survey,*		
Middletown..	1	N. pt.........................	1853.............	160
do ..	6	....	1853.............	140
do ..	14	....	Purchase 1906.....	160
do ..	23	....	1881, '85.........	160
do ..	48	....	1853.............	200
		Total, Lots 7 and 10, 820 acres.		
		HARDENBURGH PATENT GREAT LOT 9, (*Beekman Tract*)		
Andes.......	22	....	1895.............	156
do	24	....	1871, '77.........	156
do	25	All in Delaware County........	1871, '77.........	126
do	26	N. W. cor., bd. E. by county line.	1905.............	16
		Total, 454 acres.		
		HARDENBURGH PATENT GREAT LOT 35, *Division* 6,		
Tompkins....	1	N. W'ly side of all, after ex. 50a. N'ly pt.....................	1871.............	100

DELAWARE COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		HARDENBURGH PATENT, GREAT LOT 35—(*Continued*) *Division* 7,		
Tompkins....	4	....	1877, '85..........	102
		Division 14,		
Hancock.....	8	W'ly pt......................	1877, 1881........	75
		Total, Great Lot 35, 277 acres.		
		HARDENBURGH PATENT GREAT LOT, 36 *Division* 59,		
Colchester....	3	....	Con. 1920 & 1895, 1900............	505
		Division 62,		
Walton......	3	S. E. or S. E'ly ½..............	1871, '77, '81.....	77.25
		Total, Great Lot 36, 582¼ acres.		
		GREAT LOT 37, EASTERLY ALLOTMENT, (*Elmendorf, or Jacob Tremper Tract*)		
Andes.......	6	W'ly pt......................	1881, '85..........	100
		WESTERLY ALLOTMENT, (*Atkinson Tract*)		
Walton......	54	All in Walton.................	1871, '77, '81......	33
do	68	Northerly part................	1877, '81..........	111.50
		Total, Great Lot 37, 244.50 acres.		
		HARDENBURGH PATENT, GREAT LOT 40, (*New Kingston Tract*) 10th Class,		
Middletown..	7	....	1871, '85..........	55
		HARDENBURGH PATENT, GREAT LOT 42,		
Stamford.....	157	All in Stamford...............	1895.............	14.64
do	159	All in Stamford....	1895, 1900........	31.38
		Total 46.02 acres.		

DELAWARE COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		HARDENBURGH PATENT — (*Continued*)		
		GREAT LOT 51		
Stamford.....	9	N. pt.........................	1871, '85..........	82
		RAPELYEA'S PATENT,		
Tompkins....	158	....	1877, '81, '85, '95..	200
do	166	....	1871, '77, '81......	200
		Total, 400 acres.		

GREENE COUNTY

(*Total number of acres*, 17,777.38.)

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		CATSKILL PATENT		
Athens......	1	Expense lot, Van Vechten lot. E'ly part 12 ch. 95 links from S. W. cor..................	Mortgage, & 1900.	95
		CATSKILL, TOWN OF		
Catskill......	...	A triangular lot bd. E. by Page & S. & W. by Yager...........	1895.............	18
do	...	Funk, Mrs. Robert, Wood lot, bd. N. by Massino E. by C. K. Smith, S. by Funk & W. by J. H. Snyder..................	1895.............	5
do	...	Peters or Petus, Herman bd. N. by J. Carnwright, E. by E. Goodwin & C. Fiero, S. by Cooke & Hommel & W. by Chas. Griffin, being S. ½ of lot formerly owned by Peters and Cartwright.................	1895, '00.........	13
		Highway and King's Road,		
do	...	Brink, Samue C , bd. N. by F. & E. Millington E. by same and highway, S. by highway and W. by King's Road..........	1900, '05.........	2
		King's Road, *West Side,*		
do	...	Smith, Eliza or Elijah, lot in District No. 3 bd. N by R. Smith, E. by King's Road, S. by Wm H. Thrompbour, and W. by Smith and J. Sterrett..	1900.............	20
		Total, Catskill, 58 acres.		
		HARDENBURGH PATENT GREAT LOT 21 *East Part*		
Lexington....	...	Unallotted, Herbert Kipp parcel on E. line of Great Lot.	Purchase 1919....	178.40
		West Part.		
do	55	N. W. cor....................	Purchase 1900....	30

GREENE COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		HARDENBURGH PATENT, GREAT LOT 21, *West Part* — (*Continued*)		
Lexington....	56	....	1895, '00.........	195
do	57	....	Purchase 1902....	186.50
do	58	....	Purchase 1900....	187.50
do	60	....	Purchase 1900....	177
do	61	Bd. N. & E. by lands of Congdon, S. by lot 60 & land of Mead & W. by lot 34................	Purchase 1900....	156
		Tota, Great Lot 21 1,110.40 acres.		
		GREAT LOT 22, *North Part,*		
Jewett.......	27	Bloodgood parcel, b'd S'ly by land formerly of Ann Ayres...	Purchase 1908....	68.00
do	35	Bloodgood parcel, S. E. part of lot......................	Purchase 1908....	145.00
		South Township,		
Lexington....	3	W. ½........................	Purchase 1902....	79.75
do	5	....	Purchase 1902.....	154.50
do	6	W. pt......................	Purchase 1902....	46.50
do	13	....	Purchase 1902....	127.50
do	14	....	Purchase 1902....	137
do	15	....	Purchase 1902....	135.25
do	16	....	Purchase 1902....	143
do	17	....	1877, '81, '85.....	144
do	18	E. part....................	Purchase 1901....	40
do	19	S. ½.......................	1877, '81, '85.....	120
do	21	N. W. cor..................	Purchase 1900....	46
do	23	....	1877, '81, '85......	140
do	37	S. ½.......................	Purchase 1900....	109.37
do	38	....	Purchase 1900....	104.50
do	40	....	Purchase 1908....	105.50
do	41	....	1877, '81, '85 and con. 1898.......	102
do	76	S. ½.......................	Purchase 1900....	126.50
do	77	S. ½.......................	Purchase 1900....	124.50
do	78	S. ½.......................	Purchase 1900....	121.50
do	79	....	Purchase 1900....	159.75
do	80	....	Purchase 1902....	148
do	81	....	Purchase 1907....	161
do	82	....	Purchase 1902....	157.50

GREENE COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		HARDENBURGH PATENT, GREAT LOT 22, *South Township*—(*Continued*)		
Lexington....	84	....	Purchase 1900....	146.50
do	86	....	Purchase 1900....	198.50
Jewett.......	90	Ex. 50a. N. W cor. square.....	Purchase 1907....	182
Lexington....	92	....	Purchase 1907....	140.50
		BRYANT (D. W.) TRACT, (*Low Tract*)		
Lexington....	2	....	Mortgage and resale '99............	187.50
do	16,17, 18,19	Parcel beg. at a maple tree cornered on the N. W. side of brook on line between Benj. Milks and Peter Angle's (formerly) and running th. S. 54 deg. E., 77 chains along line of marked trees to stake and stones on line between the Low and Kennedy Tracts, th. S. 12 deg. W., 26 chains to stake and stones, th N. 66 deg. 26 min. W., 124 chains, 6 links to a large forked elm on N. bank of brook on line between Benj. Milks and Peter Angle's land, (formerly) and thence N. a general course along brook as it winds and turns 70 deg. E., 61 chains to place of beginning..................	Purchase 1909....	353.40
		Total Great Lot 22, 4,155.02 acres.		
		HARDENBURGH PATENT, GREAT LOT 23		
Jewett.......	49	Webster lot..................	Purchase 1909....	120.37
do	78	W. part b'd E. by highway.....	Purchase 1907.....	161
Lexington....	80	Ex. 50a. S. W. cor..........	1895, '00.........	324
do	87	North end..................	Purchase 1908....	60
do	88	North end..................	Purchase 1908....	60
do	96	West ½......................	Purchase 1908....	65.50
		Total, Great Lot 23, 790.87 acres.		

GREENE COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		HARDENBURGH PATENT — (*Continued*) GREAT LOT 24 *East Division,* *East Half,*		
Hunter......	...	Middle part across, Martin lot, 1,393 acres ex. 100 acres bd. beg. at a basswood tree, cornered, in W'ly line of said 1,393a. parcel, N. 35° E. 77c. 47l. from the 5-mile tree, cornered, which marks the S. W'ly cor. of said 1,393 acre tract, th. from said basswood tree, cornered, S. 55° E. 25c. to a stake and stones, th. N. 35° E. 40c. to a stake and stones, th. N. 55° W. 25c. to a stake and stones, and th. S. 35° W. 40c. to beg.................	Purchase 1906....	1,293
		East Division, *West Part,*		
do	50	Ex. 5.39 acres R. R............	Purchase 1909....	134.61
do	51	....	Purchase 1909....	140
do	52	....	Purchase 1909....	140
do	53	Ex. 5.39 acres R. R............	Purchase 1909....	134.61
do	54	Ex. 5.39 acres R. R............	Purchase 1909....	134.61
do	55	....	Purchase 1909....	140
do	56	....	Purchase 1909....	140
do	57	Ex. 111.33a., S. end and ex. 1.09a. R. R......................	Purchase 1909....	27.58
		West Division,		
do	...	Part of a tract of 1,000 acres in the W. part of Great lot 24 S. of Schoharie kill, bd. beg. at N. E. cor. of part of said 1,000a. owned by Ingalls & Brewer, 1871, th. S'ly along said land to S. line of said 1,000a. tract, th. E'ly along said S. line to a point in continuation of the E. line of a part of said 1,000a. tract sold Hard, th. N'ly		

GREENE COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		HARDENBURGH PATENT, GREAT LOT 24 *West Division* — (*Continued*)		
Hunter	...	along said line to the S. E. cor. of said Hard's land, th. W'ly along Hard's land to beg....	Purchase 1906....	100
do	...	Bd. beg. in W. line of Great Lot 24, 24c. S'ly of the S.W. cor. of W. W. Edwards 1,000 acre tract, bounded N. by the Schoharie Kill, th. S. 51° 20′ E. 89c. 30l. to the James Howard lot, th. S. 38° 40′ W. along said lot 20c. 70l. to S. W. cor. of said lot, th. N. 51° 20′ W. 7c. 50l. to brow of mountain, th. along said brow, to a marked spruce and stones at N. W. cor. of lands formerly of John Jansen, th. along said land S. 38° 40′ W. 5c. to a cornered spruce on ledge, to lands formerly of Nelson Van Valkenburgh th. along the ledge N. 17° 30′ W. 38c. 2l. to marked spruce on top of ledge, th. N. 14° 56′ W. 25c. 76l., th. N. 41° 26′ W. 10c. 60l. to a balsam, cornered, in W. line of Great Lot 24, th. along said W. line to beg..............	Purchase 1907.....	552.48
do	...	E. part of a 200a. tract in W. part of said Great Lot 24, bd., beg. at N. E. cor. of land of S. Becker, and at S. E. cor. of this land; th. S. 38° 40′ W. 24c. to land of Robb, th. N. 51° 20′ W. 45c. 42l. along same; th. N. 38° 40′ E. 24c. and th. S. 51° 20′ E. 45c. 42l. to beg........	Purchase 1907.....	109
Hunter	...	Bd. beg. at the N. W. cor. of lot 63, th. S. 38° 45′ W. 11c. 50l., th. N. 51° 15′ W. 20c., th. S. 38° 45′ W. 12c. 50l. to the N.		

GREENE COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		HARDENBURG PATENT GREAT LOT 24, *West Division* — (*Continued*)		
Hunter......	...	W′ly cor. of lot 62 and N. E′ly cor. of lot 61, th. along N′ly boundary of lot 61, N. 51° 15′ W. 20c. to the N. W′ly cor. of lot 61 and the E′ly bounds of lands formerly of Edward Lane, th. along said lands N. 34° 45′ E. 116c. to a large birch tree, th. S. 34° 15′ E. 13c. 15l., th. N. 37° 30′ E. 17c. 25l., th. S. 59° 45′ E. 20c. to a stake, th. N. 34° 45′ E. 4c. to lands of Fenwick Lumber Co., th. along said land S. 59° 45′ E. 14c. 40l., th. S. 45′ W. 9c., th. S. 7° 15′ W. 6c., th. S. 15° 45′ W. 45c. 50l., to lands formerly of Albert Post, th. along said land N. 12° 30′ W. 31c. to an old beech stump, th. N. 75° 30′ W. 6c. 56l. to a heap of stones, th. S. 12° E. 36c. to a heap of stones on a small brook, th. S. 52° E. 5c. 25l. to the division line between the E. ½ and W ½ of said Great Lot 24, th. along said line S. 38° 45′ W. 3c. 50l. to the N. E′ly cor. of lands formerly of Daniel Ostrander, th. along said land N. 84° W. 28c. 50l. to a heap of stones, th. N. 8° 15′ E. 12c. to a stake, th. N. 84° 30′ W. 24c. to an elm tree standing in Kibby creek, th. S. 3° 15′ W. 39 ch. 90l. to beg....	Purchase 1907....	585.50
		Total, Great Lot No. 24, 3,631.39 acres.		
		GREAT LOT 25		
do	83	....	Purchase 1917....	117
do	86	....	Purchase 1910....	776.80

GREENE COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		HARDENBURGH PATENT, GREAT LOT 25 — (*Continued*)		
Hunter......	87	All in Greene Co.............	Purchase 1917....	74
do	124	....	Purchase 1909....	250
do	130	Parcel, beg. at S. W. cor. of a lot conveyed by J. Haines to O. Tamagno, th. N. 85 deg. 50 min. W. 42c. to stones, th. N. 5 deg. 40 min. E. 8c. to stones, th. N. 85 deg. 40 min. E. 36c. to stones on a ledge, th. N. 7 deg. 40 min. E. 5c. to a beech cor. tree th. S. 82 deg. 20 min. E. 18.30c. to said Tamagno lot and th. along same S. 38 deg. 40 min. W. 22c. to beg...	Purchase 1909....	59
do	130	Parcel, beg. at S. E. cor. of the lot conveyed by J. Haines to O. Tamagno, th. S. 29 deg. 50 min. E. 42c. to the line of Great Lot 25, th. along same N. 38 deg. 40 min. E. 12c. to stones, th. N. 37 deg. 20 min. W. 40c. to said Tamagno's lot, th. along same S. 38 deg. 40 min. W. 6c. to beg..........	Purchase 1909....	36
do	131	Parcel, beg. at the S. W. cor. o a lot conveyed to C. W. Haines th. S. 38 deg. 40 min. W. 28.60c. to a spruce cor. tree, th. N. 37 deg. 20 min. W. 9c. to a birch cor. tree, th. N. 38 deg. 40 min. E. 22c. to the S. bounds of land formerly of A. Haines, th. along the same S. 82 deg. 20 min. E. 9.90c. to beg.....................	Purchase 1909....	22
		EAST HALF,		
do	...	Buddington Tract, bd. S. by State land.................	Purchase 1919....	685.04
do	...	Showers Gore, bd. E. by State land......................	Purchase 1919....	182.40
		Total, Great Lot No. 25, 2,202.24 acres.		

GREENE COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		HARDENBURGH PATENT — (*Continued*)		
		GREAT LOT 26,		
		Division 1,		
Hunter......	6	Ex. 50a. N. W. cor. 17c. N'ly & S'ly and 29c. 41l. E'ly & W'ly.	Purchase 1909....	313.00
		Divisions 6 *and* 7,		
do	18	All in Greene Co..............	Appropriated 1918.	15.00
do	19	All in Greene Co..............	Appropriated 1918.	90.60
do	20	....	Appropriated 1918.	96.30
do	21	....	Appropriated 1918.	98.80
do	24	....	Appropriated 1918.	94.80
do	25	All in Greene Co..............	Appropriated 1918.	75.90
do	26	All in Greene Co..............	Appropriated 1918.	11.00
do	33	All in Greene Co..............	Appropriated 1918.	77.80
do	34	All in Greene Co..............	Appropriated 1918.	10.20
do	42	All in Greene Co..............	Appropriated 1918.	1.60
		Total, Great Lot 26, 885 acres.		
		NEW BALTIMORE, TOWN OF,		
N. Baltimore	...	McManus, Michael; in W. part of town, bd. N. by highway, E. and S. by lands of Carton and Travis...........	1915.............	22.00
		STATE LAND TRACT,*		
Cairo........	30	All in Cairo..................	Purchase 1900....	356
Jewett......	30	All in Jewett.................	Purchase 1900....	48
Cairo........	33	....	Purchase 1900....	277
do	34	S. E. corner square.......,....	Appropriated 1918.	62.50
do	35	N. W. corner 50c. 70l E'ly & W'ly and 22c. 18½l. N'ly & S'ly	Purchase 1910....	112.48
do	36	S. end........................	Purchase 1909....	100.73
do	40	S. W. corner..................	Purchase 1919....	30.60
do	41	....	Original & resale 1867...........	173.25
do	43	....	Purchase 1909....	118.00
Windham....	51	S. E. part (McGlashan)........	Purchase 1910....	181.38
do	52	S. W. part (McGlashan).......	Purchase 1910....	255.35

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* This tract of land is sometimes called "Tract between Batavia Patent and Caderskill" and also sometimes "Greene Co. Tract."

GREENE COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		STATE LAND TRACT—(*Continued*)		
Windham....	52	N. part, bd. N'ly by height of ground....................	Purchase 1913....	23.50
do	53	All in Windham ex. 9.07a. in S. W. corner (Phelps)........	Purchase 1913....	360.50
Cairo........	53	N. E'ly part (Mackey).........	Purchase 1919....	202.00
do	53	E'ly part (Meddaugh)..........	Purchase 1919....	157.00
Windham....	62	Ex. 100 acres N. W. cor. 25c. E'ly & W'ly and 40c. N'ly & S'ly.....................	Purchase 1913....	756.00
do	68	....	Purchase 1919.....	212.00
do	69	....	Purchase 1919....	212.00
do	74	All in Windham...............	Original & resale 1899...........	14.00
Jewett.......	74	All in Jewett.................	Original & resale 1899...........	110.00
do	75	S. pt. bd. N. by town line......	Purchase 1900....	84.00
do	76	....	Purchase 1900....	274.00
do	77	Parcel across lot, bd. S. by land of T. Moore and N. by J. Haines....................	Purchase 1909....	60.60
Windham....	78	All in Windham..............	Purchase 1919....	145.40
do	79	....	Pur. 1909, '19.....	501.17
		Total, State Land Tract, 4,827.46 acres.		

SULLIVAN COUNTY

(*Total number of acres,* 1,157.18.)

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		HARDENBURGH PATENT GREAT LOT 1, *Division* 30,		
Thompson	8	Ebenezer Coddington lot, bd. N. by lands of P. C. Brown, E. by D. Stratton, S. by W. A. Hansee lot and W. by land of E. Coddington	1900, '05	47
		Division 84,		
Mamakating		Est. of Josiah Greene, bd. N. E. and W. by Est. of J. W. Cudney, and S. by highway	1895	1
		Total, Great Lot 1, 48 acres.		
		HARDENBURGH PATENT, GREAT LOT 3, FOURTH ALLOTMENT, *Division* 4,		
Liberty	2	N. W. cor.; (Lockwood)	1905	25
		HARDENBURGH PATENT, GREAT LOT 4, EAST DIVISION, *Middle Allotment,*		
Neversink	29		1871	126
		West Allotment,		
do	22	Ex. 28a. N. E. cor. bd. S. by Cogan, $8\frac{1}{10}$a. N. W. cor. bd. E. by Hanophy, and 28a. S. E. cor. bd. N. by Hanophy	1871	32.20
		MIDDLE DIVISION, *West Allotment,*		
Rockland	17–18	Hatchery Lot	Purchase 1893	4.75
do	89	Clark, Edward	1915	.13
		Total, Great Lot 4, 163.08 acres.		

SULLIVAN COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		HARDENBURGH PATENT — (*Con.*) GREAT LOT 5,		
Neversink....	528	S. pt..........................	1871............	112
		HARDENBURGH PATENT, GREAT LOT 14, *East* ½,		
Thompson...	70	W. W. Gilman lot, bd. N. by C. Delany, E. by Jas. Osterhout, S. by Jno. Ruddick and W. by J. Crowley...........	1900............	114
		HARDENBURGH PATENT, GREAT LOT 17, *Division* 51,		
Bethel......	29	Tillotson & Wainright.........	1910............	55.50
do	30	Tillotson & Wainright.........	1910............	40.50
		Total, Great Lot No. 17, 96 acres.		
		MINISINK PATENT, DIVISION 1,		
Forestburgh..	11	Whole lot, 1,707a., ex. $41\frac{2}{100}$a. (R. C. West) bd. N. by lot 12, S. & E'ly by Beakes & Otis, & W. by W. A. Stokes $85\frac{8}{100}$a. (W. A. Stokes) bd. N. by lot 12, S. by J. J. Stewart & Beakes & Otis, E. by R. C. West, 728a. (Beakes & Otis), S'ly end, 516½a. (J. H. Stewart) bd. N'ly by Stokes, a tract called the "gore" and the "Mill lot" so called, S. E'ly by Beakes & Otis, & S. W'ly & N. W'ly by lot lines, Sub. 4 (106a., H. L. West), & 114a. being the und. ½ of 228a. (pd. April 24th, 1828, by William Thomas), $1{,}590\frac{51}{100}$ acres.....	1826............	116.42
Mamakating.	41	William Ferris Tract, b'd N. by Griffin and Wright, E. by J. Gillett, S. by Skinner and W. by Cole and Tillson.......	1915............	110.00

SULLIVAN COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		MINISINK PATENT, DIVISION 1 —*Continued* MERRIEWOLD PARK, BLOCK D,		
Forestburgh..	11	Hill, Mary....................	1915.............	.50
do ..	53	Holt, B. W. or Moro, J. J.......	1915.............	.50
do ..	104	Bronson, C. H................	1915.............	.50
do ..	120	Alexander, P..................	1915.............	.50
do ..	189	Abernell, J...................	1915.............	.50
do	193	Verins, Mrs. E. G.............	1915.............	.50
do	199	Spellane, J. B................	1915.............	.50
		Total, Division One, 229.92 acres.		
		MINISINK PATENT, DIVISION 7,		
Highland....	16	All of original Sub. 8 as shown on a map made by Wm. Cockburn & John Kiersted, lying N. of a line par'l to & 3 miles S. of Mt. Hope and Lumberland Turnpike.............	Mortgage 1822....	41.66
do	18	Sub. 5......................	1895.............	100
do	18	Sub. 18.....................	1871, '77, '81.....	50
Lumberland..	31	Sub. 25.....................	1895, '00..........	46.40
do ..	31	Sub. 26.....................	1895, '00..........	64
do ..	37	Sub. 4......................	1895, '00..........	67
		Total, Division 7, 369.06 acres.		
		PHILLIPSPORT VILLAGE,		
Mamakating.	.....	Hanyen, William H., heirs; bd. N. by lands of Mrs. James Allen, E. by the Kingston Public Road, S. by lands of Mrs. Berdell S. Johnson, and W. by lands of J. B. Daved or Deved....................	1905.............	.12

ULSTER COUNTY

(*Total number of acres,* 90,848.69.)

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		ESOPUS, TOWN OF, Cedarhurst Park, (On Mirror Lake)		
Esopus	14	Burchell, R. B.	1915	.13
		(Unallotted)		
do	...	Boyle, John O. or Gilmore, William; b'd. N. & E. by Freer, S. by Terpening and W. by highway	1915	.50
do	...	Coutant, Jenkins & Kraft; b'd. N. by Deyo, E. by Welsh, S. by McNeary and W. by Lichtenburgh	1915	5.00
do	...	Coutant Chas. T.; Rosekran's lot, between highway and Rondout Creek near village of New Salem (50 x 400 ft)	1915	.50
do	...	Deyo, Clinton or Charles, Heirs of; (wood land) b'd N. by McNeary or Wicks, E. by Tschirsky or Donaldson, S. by Tschirsky or Wicks and W. by McNeary, Ferguson or Wicks	1915	5.00
do	...	Deyo, Peter, (wood land;) b'd N. by Sonomela, E. by Rennie and Rossner and S. & W. by Varick	1915	64.00
do	...	Holman, Wm.; Daley farm; 17a. ex. 8a. across E. side	1915	9.00
do	...	Maloy, Sarah A., or heirs, bd. N. by Everson St., E. by Wm. Hayes, S. by Robert Hayes and W. by highway to Port Ewen (50 x 100)	1905, '10	.12
do	...	Osterhout, Julius; parcel 50 x 100 ft. near New Salem; bd. N. by Cornell, E. by highway, S. by a small stream dividing Election Districts 1 and 2 and W. by Rondout Creek	1905, '10	.12

ULSTER COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		ESOPUS, TOWN OF — (*Continued*)		
Esopus.......	...	Quick, James T.; bd. N. by Jerry Auchmoody & S. T. Litts, E. by lands of Rosmer or Rosner, & S. W. by lands of Laflin & Rand Powder Co.............	1895, '00..........	7.00
do	...	Van Keuren, Marenus, heirs of; near Union Center, bd. N. by Wells, E. by Cole, S. by Perry and W. by Van Aken.........	1915.............	5.50
do	...	Wood, John R., heirs of; bd. N. by Richard Deyo, E. by Joseph Welch, S. by Julia McEneary and W'ly by T. Schirsky or E. Litchenburg, 7 acres ex 5 acres E. side.....................	1910.............	2.00
do	...	Wood land; bd. N. by Nichols E. by Taylor and S. & W. by Dumond...................	1895, 1910........	30.00
do	..	Wood land; bd. N. by George D. Frear & Charles Lake, E. by Jonas Frear, S. by Alex. Humphrey & W. by Hanna Hunt..	1881.............	20.00
do	...	Parcel, bd. N. by Demaron and Sutcliffe, E. by Kniffin and Martin or heirs of Demaron and S. & W. by J. Sutcliffe....	1915	2.00
do	...	Parcel, bd. N. by Fountain, E. by M. Fountain, Pell and Griffiths, S. by Terpening and W. by Rich......................	1905.............	17.00
		Total, Town of Esopus, 167.87 acres		
		GARDINER, TOWN OF		
Gardiner.....	...	Degnon Contracting Co.; bd. N. by highway, E. by Railway and S. & W. by Pruss (80 x 164)..	1915.............	.23
Gardiner.....	...	Jenkins, Albert, or Est., bd. N. & E. by Lambert Jenkins, or by		

ULSTER COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		GARDINER, TOWN OF — (*Cont'd*) the highway, S. by Luther Lefever and W. by John Jenkins	1900	.50
Gardiner	...	Slater, Peter; bd N. & E. by John D. Van Leuven, S. by George Davis & W. by the top of the mountain	1895	30.00
do	...	Van Wagoner, Josiah H., pt. of lot 19, Partners Tract, bd. N. by John H. Van Wagoner, E. by top of mountain, S. by land of P. P. Aldrich, & W. by Wm. Enderly estate	1877, & C. T. 1879.	5.70
do	...	Van Wagoner, Cornelia D. part of lot 19, Partners Tract, bd B. by Methuselah Dubois, E. by top of mountain, S. by Sahler and Turpening, & W. by Wm. Enderly estate	1877 & C. T. 1879.	6.00
		Total, town of Gardiner 42.53 acres.		
		GRAHAM'S OR GRAME'S PATENT,		
Plattekill	...	Flagler, Francis; bd. N. by S. Penny, E. by Derant & others, S. by J. Harris, & W. by J B. Griffin	1877	5.00
do	...	Lockwood, Wm.; bd. N.by Lockwood, E. by N. Adams or J. S. Cosmond or Crosmon, & W. by Pembrook, or Tenbrook	1877, '81, '85 & C. T. 1879	5.00
		Total, Graham's Patent, 10 acres.		
		GREEN'S PATENT,		
Plattekill	.....	Gillis, Jesse bd. N. by J. Lockwood E. by Green or Gerow & S. & W. by Wm. Pembrook or W. Tenbrouck	1877, '81, '85	8.00

ULSTER COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		GROTE TRANSPORT, See Rochester Patent,		
		HARDENBURGH PATENT, GREAT LOT 6, *Bowen's Survey of East Part,* 8,000 *Acre Tract,* *Benedict Tract*		
Denning.....	1	....	Pur. 1905 & 1905, '10............	112
do	2	....	Pur. 1905 & 1905, '10............	100
do	8	....	Pur. 1905 & 1905 '10............	100
		Pell (Robert L.) 4,000 *Acre Tract,*		
do	1	....	1877, '81..........	100
do	3	....	1871, '77, '81.....	100
do	4	....	1871, '77, '81.....	100
do	5	....	Purchase 1906....	100
do	6	....	Purchase 1906....	100
do	7	....	1877, '81, & C. T.*.	100
do	13	....	Purchase 1902....	100
do	14	....	Purchase 1902....	100
do	15	....	Purchase 1902....	100
do	16	W. pt..........................	1877, '81 '95 & C. T. 1880........	50
do	17	....	1877, '81, '95 & C. T. 1880........	100
do	18	....	1877, '81, '95 & C. T. 1879, '80.....	100
do	19	....	1877, '81, '95 & C. T. 1880........	100
do	20	....	1877, '81, '95 & C. T. 1880........	100
do	21	....	1877, '81, '95 & C. T. 1880........	100
do	22	....	1877, '81, '95 & C. T. 1880........	100
do	23	....	1877, '81, '95 & C. T. 1880........	100
do	24	....	1877, '81, '95 & C. T. 1880........	100

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*County Treasurer's sale, 1879.

ULSTER COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		HARDENBURGH PATENT, GREAT LOT 6, EAST PART, *Pell (Robert L.) 4,000 Acre Tract — (Continued)*		
Denning.....	25	....	1877, '81, '95 & C. T. 1880.........	100
do	26	....	1877, '81, '95 & C. T. 1879, '80.....	100
do	27	....	1877, '81, '95 & C. T. 1879, '80.....	100
do	28	....	Purchase 1902....	100
do	29	....	Purchase 1902....	100
do	30	....	Purchase 1902....	100
do	31	....	Purchase 1902....	100
do	32	....	Purchase 1902....	100
do	33	....	Purchase 1902....	100
do	34	....	Purchase 1902....	100
do	35	....	Purchase 1902....	100
do	36	....	Purchase 1902....	100
do	37	....	Purchase 1902....	100
do	38	....	Purchase 1902....	100
do	39	....	Purchase 1902....	100
do	40	....	Purchase 1902....	100
		Total, Pell and Benedict Tracts, 3,662 acres.		
		HARDENBURGH PATENT, GREAT LOT 6, DIVISION ONE, *(Denning Tract)*		
do	7	Central part b'd W'ly by Bear Hole Brook (Aldrich).........	Purchase 1919....	78.75
do	8	W'ly part (Stickle and Aldrich)..	Purchase 1909, '19.	132.50
do	9	Ex. strip 200 ft. wide W. of center of Buttermilk Falls Brook (Ryan and Aldrich)....	Purchase 1900, '19.	167.50
do	11	....	Purchase 1908....	184
do	25	....	Purchase 1901....	160
do	26	....	Purchase 1908....	160
do	29	....	Purchase 1902....	160
do	30	....	Purchase 1901....	160
do	32	E. pt........................	Purchase 1902....	60
do	33	S. W. cor....................	Purchase 1907....	54

ULSTER COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		HARDENBURGH PATENT, GREAT LOT 6, DIVISION 1, (*Denning Tract* — (*Continued*)		
Denning.....	35	N. W. cor....................	Purchase 1907....	13
do	36	S. W. cor....................	Purchase 1907....	29.30
do	37	E. side b'd W'ly by Van Wagner.	Purchase 1907....	69
do	38	N. E. and S. E. sides..........	Purchase 1907....	149.30
do	40	S. end, B'd N. by Moe.........	Purchase 1907....	98.40
do	62	Ex. S. E. cor (Barber) 18ch. E'ly & W'ly and 10ch. N'ly & S'ly.......................	Purchase 1902....	142
do	63	....	Purchase 1907....	160
do	81	S. E. cor....................	1895.............	14
do	102	....	Purchase 1906....	160
do	115	S. of W. branch of Neversink Creek and W. of Iron Brook..	Purchase 1906....	148.50
do	116	S. E. part (Satterlee) b'd N. by Iron Brook................	Purchase 1906....	11.50
		Total, Denning Tract, 2,326.75 acres.		
		GREAT LOT 6, DIVISION 2, (*Connecticut Tract*)		
Hardenburgh	1	....	1881, C. T.* 1883..	197
do	4	....	1877, '85 & C. T. '79............	195
Denning.....	5	....	1881, '85 & C. T '79............	192.50
do	6	....	1877, '81, '85 & C. T. 1879, '80.....	180
do	7	....	1877, '81, '85 & C. T. 1879, '80.....	248.75
do	11	....	Pur. 1906 & 1905 '10............	197.50
do	12	....	Pur. 1906 & 1905 '10............	192
do	13	....	1877, '81, '85 & C. T. 1879, '80.....	182.75
do	14	....	1877, '81, '85 & C. T. 1879, '80.....	251.75
Hardenburgh	17	....	1881, '85, '90.....	105
Denning.....	18	....	1877, '81, '85 & C. T. 1879, '80.....	98.25

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* County Treasurer's sale.

ULSTER COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		HARDENBURGH PATENT, GREAT LOT 6, DIVISION 2, (*Connecticut Tract*)—(*Continued*)		
Denning	19		1877, '81, '85 & C. T.* 1880	94.50
do	20		1877, '81, '85 & C. T. 1879, '80	86.75
Hardenburgh	22		1881, '85, '95	126
do	24		1885, '90, '95	120
Denning	25		1877, '81, '85, '90 & C. T. 1879, '80.	109.75
do	26		1877, '81, '85, '90 & C. T. 1879, '80.	102.50
do	28		1881, '85 & C. T. '79	133.50
Hardenburgh	29		1877, '81, '85 & C. T. 1879, '80	103
Denning	31		1877, '81, '85 & C. T. 1879, '80.	124
do	32		1877, '81, '85 & C. T. 1879, '80.	123.75
do	33		1877, '81, '85 & C. T. 1879, '80.	118.50
do	34		Purchase 1906	112.50
do	35		1881 & C. T. 1879.	156
Hardenburgh	36		1877, '81, '85 & C. T. 1879, '80, '81.	71
do	37		1881, '85 & C. T	72
Denning	38		1877, '81, '85 & C. T. 1879, '80	82.25
do	39		1877, '81, '85 & C. T. 1879, 80.	87
do	40		1877, '81, '85 & C. T. 1879, '80	89
do	42		1877 & C. T. 1879.	127
Hardenburgh	43		1871, '77, '81, '90	98
do	44		1877, '81, & C. T.	91
Denning	45		1877, '81, '85 & C. T. 1879, '80	96.50
do	46		1877, '81, '85	90.75
do	47		1877, '81 & C. T.*	63.75

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* County Treasurer's sale.

ULSTER COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		HARDENBURGH PATENT, GREAT LOT 6, DIVISION 2 — (*Connecticut Tract*) (*Continued*)		
Hardenburgh	50		Pur. 1902 & 1910	90
Denning	52		1877, '81, '85 & C. T. 1879, '80	94.75
do	53		1877, '81 & C. T.*	93
do	54		1877, '81 & C. T.*	87
do	56		1881 & C. T. 1879	128
Hardenburgh	57		1877, '81 & C. T.*	95
Denning	58		1895, '00	95
do	59		1877 & C. T. 1879	99
do	60		1877, '81, '85 & C. T. 1879, '80	97.75
do	61		1877, '81, '85	92.50
do	66		1881 & C. T.*1880	96
do	67		1881, '85 & C. T.*	96.75
do	68		1877, '81, '85	90.75
do	74		Pur. 1902 & 1905	106
do	75		1877, '81, '85	91.75
do	76		1877, '81, '85 & C. T. 1879, '80	96
do	78		1877, '85 & C. T.*	85.75
do	81		1877, '81, '85	89.50
do	82		1877, '81, '85	86.50
do	83		1877, '81, '85	85.25
do	85		1877, '81, '85, '95	100
do	89		1877, '81, '85 & C. T. 1879, '80	109.75
do	90		Purchase 1899	111
do	93		1877, '81, '85 & C. T. 1879, '80	112.50 129.50
do	106		Pur. 1902 & 1871, '77, '05	134.25
do	108		1881, '85 & C. T. 1879, '80, '81	153
do	112		Pur. 1900 & 1905	127
do	113		1877, '81, '85 & C. T. 1879, '80	142.50
do	118	W. part	Pur. 1905 & 1905	60
		Total, Connecticut Tract, 7,595.25 acres.		

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* County Treasurer's sale, 1879.

ULSTER COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		HARDENBURGH PATENT, GREAT LOT 6 — (*Continued*) DIVISION 3, (*Robinson Tract*)		
Hardenburgh.	194		Purchase 1899	143
do	196		1877	148
do	207		Purchase 1900	120
do	215		Purchase 1902	143
do	216		Purchase 1899	130
do	217		Purchase 1899	133
do	218		1877, ’81, ’85 & C. T. 1879, ’80	127
do	219		1877, ’81, ’85 & C. T. 1879, ’80	129
do	220		1877, ’81, ’85, & C. T. 1879, ’80	142
do	221		1877, ’81, ’85 & C. T. * 1879, ’80	141
do	222		1877, ’81, ’85 & C. T. 1879, ’80	145
do	227		1877, ’81, ’85 & C. T. * 1879, ’80	161
do	228		1877, ’81, C. T. 1880	115
do	229		1877	137
do	232		1877, ’81, ’85 & C. T. * 1879, ’80	140
do	233		1877, ’81, ’85 & C. T. * 1879, ’80	115
do	234		1877, ’81, ’85 & C. T.* 1879	164
do	239		1877, ’81 & C. T. ’79	142
do	244		1877, ’81, ’85 & C. T. * 1879, ’80	112
do	248		Purchase 1901	134
do	253		1877, ’81, ’85 & C. T. * 1879, ’80	161
do	254		1877, ’81, ’85 & C. T. * 1879, ’80	110
do	258		Purchase 1900	134.75
do	259		Purchase 1900	109
do	260		1877, ’81, ’85 & C. T. 1879, ’80	162
do	268		Purchase 1901	120

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* County Treasurer’s sale.

ULSTER COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		HARDENBURGH PATENT, GREAT LOT 6, DIVISION 3 (*Robinson Tract*)— (*Continued*)		
Hardenburgh.	269	....	1877, '81, '85 & C. T. 1879, '80.....	105
do	270	....	Pur. 1900 & 1905...	98
do	271	....	Purchase 1901.....	117
do	274	....	1881, '85 & C. T. 1879, '80.......	135
do	275	....	Pur. 1900, 1901...	136
do	276	....	Purchase 1901.....	136
do	277	....	Pur. 1900 & 1905 .	131
do	278	....	Pur. 1900 & 1905...	138
do	279	....	Purchase 1900......	166.25
do	280	....	Purchase 1900.....	109.50
do	281	....	Purchase 1900.....	137.75
		Total, Robinson Tract, 4,927.25 acres.		
		HARDENBURGH PATENT, GREAT LOT 7, ALLOTMENT SOUTH OF BUSHKILL		
Olive........	3	Z. P. Boice parcel, bd. beg. at stones in the line of Marbletown Pat., the S. E. cor. of Peter P. Barringer, th. S. 69° 45′ W. along same and of Chas. Hamilton 42c. 42l. to stones and soft maple sapling at foot of hill, th. S. 48° 30′ W. along line of Hamilton and Henry Bartlett 69c. 20l. to stones against the E. side of High Point Mountain in line formerly of Solomon Barringer, th. S. 45° 45′ E. along said line 32c. 80l. to stones on a high rock on top of Round Top Mountain, a cor. of Martin Winchell's farm, th. N. 45° 45′ E. 63c. 80l. to stones at foot of		

ULSTER COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		HARDENBURG PATENT, GREAT LOT 7, ALLOTMENT SOUTH OF BUSHKILL — (*Continued*)		
Olive	3	hill, a corner of the Martin Winchell farm, th. N. 26° 45′ W. 8c. 50l. to stones at foot of ledge, th. N. 22° 45′ E. 8c. 75l. to an old maple stump on N. side of brook, th. down brook N. 73½° E. 2c. 20l., th. S. 83° E. 4c., th. N. 89° E. 4c. to stones on N. side of brook, th. S. 54° E. 7c. 50l., th. S. 84° 50′ E. 6c. 28l. to stones on the Marbletown line & th. N. 1° E. along Marbletown line 28c. 14l. to beg. (formerly Benjamin Hyatt)	Purchase 1906	277.70
		GREAT LOT 7, *Chamber's Survey,*		
Denning	2		1877, '81, '85 & C. T.* 1879, '80	86
do	3		1877, '81, '85 & C. T. 1879, '80	85
do	6		1877, '81 & C.T.'79	83.75
do	7		Purchase 1902	79
do	8		1881, '85 & C. T.'79	85
do	9		1877, '81, '85 & C. T.* 1879, '80	84
do	10		1881 & C. T. 1879	83
do	11		1881, '85 & C.T.'79	81.30
do	12		1877, '81, '85 & C. T.* 1879, '80	106
do	13		1877, '81, '85 & C. T.* 1879, '80	118.50
do	14		1877, '81, '85 & C. T.* 1879, '80	100
do	15		1877, '81, '85 & C. T.* 1879, '80	100

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* County Treasurer's sale.

ULSTER COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		HARDENBURGH PATENT, GREAT LOT 7, *Chamber's Survey* — (*Continued*)		
Denning.....	18	....	1877, '81, '85 & C. T.* 1879, '80....	99.80
do	25	....	1877, '81, '85 & C. T.* 1879, '80....	101
do	26	....	1877, '81, '85 & C. T.* 1879, '80....	100
do	27	....	1877, '81, '85 & C. T.* 1879, '80....	99.50
do	28	....	1877, '81, '85 & C. T.* 1879, '80....	100
do	30	....	1877, '81, '85 & C. T.* 1879, '80....	123
do	33	....	1881 & C. T.* 1879	101
do	37	....	1881, '85 & C. T.'79	150
do	38	....	1881 & C. T.* 1879	150
do	39	....	1881 & C. T.* 1879	80
do	40	....	1881 & C. T.* 1879	183
		Total, Chamber's Survey, 2,378.85 acres.		
		GREAT LOT 7, *Garretson Tract*,		
Hardenburgh.	14	....	1881, C. T. 1879 & appro. 1918.....	160
do	15	....	1881, C. T. 1879 & appro. 1918.....	160
do	16	....	1881, '90, '95.....	160
do	17	All in Hardenburgh............	Purchase 1900....	48
Shandaken...	17	All in Shandaken..............	Purchase 1900....	112
Hardenburgh.	18	....	Pur. 1907 & 1910..	240
do	20	All in Hardenburgh............	Pur. 1900 & 1905..	5
Shandaken...	20	All in Shandaken..............	Pur. 1900 & 1905..	155
do ...	21	All in Shandaken..............	Pur. 1900 & 1905..	15
Hardenburgh.	21	All in Hardenburgh............	Pur. 1900 & 1905..	145
do	22	....	1881, '90, '95 & C. T.* 1879.......	151
do	23	....	1885 & appro. 1918	149
do	24	....	Appropriated 1918.	148

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* County Treasurer's sale.

ULSTER COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		HARDENBURGH PATENT, GREAT LOT 7 — *Garretson Tract* — (*Continued*)		
Hardenburgh.	25	....	1877, '81, '85, C. T.* '79 & appro. 1918.	146
do	50	N. ½........................	Appropriated 1918.	87
do	51	N. ½........................	Appropriated 1918.	88
do	54	All in Hardenburgh............	1877, '81, '85......	164
Shandaken...	54	All in Shandaken..............	1877, '81, '85.....	56
Hardenburgh.	55	....	Pur. 1900 & 1905..	168
do	57	....	Purchase 1900....	240
do	58	All in Hardenburgh............	Purchase 1900....	64
Shandaken...	58	All in Shandaken..............	Purchase 1900....	96
do ...	59	All in Shandaken..............	Purchase 1900....	3
Hardenburgh.	59	All in Hardenburgh............	Purchase 1900....	157
do	84	All in Ulster County ex. und. ½ of 10a. N. W. side.........	Purchase 1906....	25
do	92	Ex. Parcel in N. end 10 ch. E'ly & W'ly and 40 ch. N'ly & S'ly	Appropriated 1918.	120
Hardenburgh.	93	....	1866, '77, '81, '85 & C. T.* 1879, '80	160
do	94	....	1881 & C. T.* 1880	160
do	95	All in Hardenburgh............	1881, '85 & C. T. 1879, '80.......	138
Shandaken...	95	All in Shandaken..............	1877, '81, '85 & C. T.* 1879, '80....	22
do ...	96	All in Shandaken..............	1881, '85 & C. T.'79	231
Hardenburgh.	97	All in Hardenburgh............	1881, '85 & C. T.'79	9
do	97	All in Hardenburgh............	Purchase 1900....	224
Shandaken...	97	All in Shandaken..............	Purchase 1900....	16
Hardenburgh.	98	....	Purchase 1900....	160
do	99	....	1881, '85.........	160
do	107	....	1877, '81, '85......	147
do	108	....	1881, '85.........	150
do	109	All in Ulster County...........	Purchase 1900....	75
do	129	....	1881, '85.........	187
do	138	....	1877, '81, '85, '90 & C. T.* 1879...	333
		Total, Garretson Tract, 5,169 acres.		

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* County Treasurer's sale.

ULSTER COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		HARDENBURGH PATENT, GREAT LOT 7 — (*Continued*) *Livingston Tract,* *Division* 1,		
Shandaken...	1	....	Purchase 1907....	132
do ...	2	Bd. N. E'ly by Lot 3, and Great Lot 8, N. W'ly, W'ly and S'ly by Farm Lots 1, 2, 3, 4, 5, 6, 7, 10 and 11, ex. 1 acre School lot, 21 acres Patterson lot and 100 acres Christopher Long Lot........................	Purchase 1900....	468
do ...	4	....	Pur. 1900 & 1905..	1,000
do ...	5	....	Pur. 1900 & 1905..	1,000
do ...	6	Ex. 150a. N. E. part, 21 ch. E'ly from N. W. cor. of lot........	Purchase 1901....	915
do ...	7	....	Purchase 1901.....	1,065
do ...	8	....	Pur. 1900 & 1905..	1,115
Olive........	9	98½ acres described as bd. beg at cor. of lots 9 and 10, Divisions 1 and 2, th. N. 50° 30′ W. along line between Divisions 1 and 2, 21c. to a pile of stones on top of Blackberry mountain, th. N. 7° 15′ W. along the average top of said mountain 46c. to a pile of stones on top of said mountain, th. S. 50° 30′ E. 35c. to center of Drykill Brook, th. down said brook 23° 35′ E. 2c. 13l., th. S. 77° 35′ E. 84l., th. S. 29¼° E. 2c. 60l., th. S. 18° E. 1c. 93l. to E'ly line of said lot 9, Division 1, and th. S. 37° W. along said Division line 17c. 25l. to beg. (Z. P. Boice)...........	Purchase 1908....	98.50
Olive & Shandaken.....	9	600 acre parcel beg. at a stake & heap of stones on top of Samuel's Point, in the Town of Olive, th. N. 77° 32′ W. 60c. to where a tree formerly stood,		

ULSTER COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		HARDENBURGH PATENT, GREAT LOT 7, LIVINGSTON TRACT, *Division* 1 — (*Continued*)		
Olive & Shandaken.....		with stones around it, th. S. 11° 2′ E. 40c., th. N. 49° 32′ W. 55c. to a beech tree, th. N. 40° 28′ E. 90c. 35l. to a stake & heap of stones, th. S. 78° 12′ E. 81c. 71l. to a stake & heap of stones near a road, th. S. 40° 28′ W. 80c. 21l. to the top of Sam's Point to beg. (Hoornbeek)......................	Purchase 1901....	600.00
Olive........	10	Bd. beg. at a heap of stones around a soft maple, a corner of John Ennist, Jr., th. N. 50° W. along land of Lewis Bell 33c. to a heap of stones near a birch tree on W. side of Blackberry mountain, th. N. 33° E. 16c. to a heap of stones against a birch tree in division line of Livingston; th. S. 34° E. 43c. to a birch tree and stones in said division line, a corner of Adam Traver, th. S. 40° W. along his bounds 12c. to a rock oak tree against a ledge of rocks and th. N. 5° E. 6c. to beg. (Bell)..................	Purchase 1907....	46.00
		Livingston Tract, *Division* 2,		
Shandaken...	3	Gore lot, bd. beg. at a heap of stones, the E. cor. of lot 13 of farms, th. along lot 4, Division 2, to a heap of stones the W. cor. of lot 3, Division 1, th. along same N. 53° 10′ W. 95c. to cor. of lots 2 & 3, Division 1 and cor. of No. 11 of farms, th. along said No. 11, S. 1° E.		

ULSTER COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		HARDENBURGH PATENT, GREAT LOT 7, LIVINGSTON TRACT, *Division 2*—(*Continued*)		
Seandaken	3	18c. to stones in line of No. 12 of farms, th. along same S. 89° E. 10c. to E. cor. of lot 13 of farms and th. S. 35° E. along lots 12 & 13 of farms 82c. to beg	Purchase 1900	190.00
do	3	S. E. part (Miles Parker)	Purchase 1909	254.46
do	6		Pur. 1900 & 1905	1,000
do	7		Pur. 1900 & 1905	1,000
do	8		Pur. 1901 & 1905	1,000
Olive	9	N. E. part (Boice)	Purchase 1906	246.70
do	10	W. center part (Boice)	Purchase 1906	90.60
		Livingston Tract, Division 3,		
Shandaken	1		Pur. 1900 & 1905	1,120
do	2		Pur. 1900 & 1905	885
do	3	Ex. 59a. N. W. corner	1881, C. T. 1882 & Purchase 1907	1,026
do	4	Ex. 161a. S. E'ly cor. 46c. N. E'ly and S. W'ly and 35c. N. W'ly and S. E'ly	Pur. 1907 & 1881, 1910 & C. T., 1882	929
do	6	Ex. 20a. N. E. cor. sq	Purchase 1900	1,100
do	7		1881 & C. T. 1879	1,100
do	8		1881, '85 & C. T.	1,100
do	8		1881, '85 & C. T.	1,115
do	9	All in Shandaken	Purchase 1900	790
		Total, Livingston Tract, 18,286.26 acres.		
		HARDENBURGH PATENT, GREAT LOT 7, SOUTH PART, (EAST END) TEN THOUSAND ACRE TRACT, (VERPLANK AND QUILLARD)		
Olive	.....	Nathan W. Watson parcels bid N'ly by N. part of Great Lot 7, E. by Marbletown Pat. W. by Chambers' Survey	Mortgage	1,700

ULSTER COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		HARDENBURGH PATENT, GREAT LOT 7, SOUTH PART (EAST END), TEN THOUSAND ACRE TRACT (VERPLANK AND QUILLARD) — (*Continued*)		
Olive........	.....	A parcel in the Krom lot, bd. beg. at N'ly end of a rock in the Bushkill or Canape Stream in line of Catherine Every; the. N. 33° 50′ E. along her bounds 34c. to a heap of stones in the line of Watson, th. S. 57° E. along his bounds 19c. 50l. to a stake and stones against the mountain th. S. 33° 50′ W. 40c. 50l. to stones around a hemlock sapling, on the N'ly side of said Canape stream, th. N'ly down same, as it winds and turns, to beg., $72\frac{6}{10}$ a. ex. 15a. square, in N. W. cor. thereof (Jones).....................	Purchase 1907....	57.60
do	.....	Coutant, Jenkins & Kraft Mountain lot (in the Krom lot)	1915.............	80.00
		Total, 1,837.60 acres.		
		GREAT LOT 7, UNALLOTTED,		
Denning.....	....	Bd. N'ly by town of Shandaken, E. by Vernoy's survey of 80 lots, S. by an 864a. tract, & W. by town of Hardenburgh......	Purchase 1899....	1,325
		GREAT LOT 7, VERNOOY'S SURVEY,		
do	3	....	1881, '85, '90 & C. T. '79..........	160
do	7	....	1877, '81, '85, '90 & C. T. * 1879....	160
do	8	....	1877, '81, '85, '90 & C. T.* 1882, '84	160
do	9	....	Purchase 1906.....	160

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* County Treasurer's sale, 1879.

ULSTER COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		HARDENBURGH PATENT, GREAT LOT 7 — *Vernooy's Survey* — (*Continued*)		
Denning.....	10	....	1881, '85 & C. T. * 1879, '80........	160
do	12	N. side 15c. N. & S............	Purchase 1907.....	60
do	13	....	1877, '81, '95 & C. T. 1879*..........	160
do	16	....	1877, '81, '85 & C. T. *1879, '80....	160
do	17	....	1877, '81, '85 & C. T.* 1879, '80....	160
do	18	....	1877, '81, '85 & C. T.* 1879, '80....	160
do	19	....	1877, '81, '85, '90 .	160
do	22	....	1881, '85, '90......	160
do	23	....	Pur. 1906 & 1905, '15.............	160
do	24	....	1877, '81, '85 & C. T.* 1879, '80....	176
do	25	....	1877, '81, '85 & C. T.* 1879........	176
do	26	....	1881, '85..........	160
do	27	....	1890, '95..........	160
do	29	....	Purchase 1902.....	160
do	30	....	1877, '81, '85 & C. T.* 1879, '80....	160
do	31	....	Pur. 1906 & 1905, '10.............	160
do	32	....	1877, '81, '85 & C. T. * 1879, '80...	160
do	33	....	1877, '81, '85......	160
do	36	....	1877, '81, '85 & C. T.* 1879, '80....	160
do	37	....	1881, '85 & C. T.* 1879, '80........	200
do	38	....	1877, '81, '85 & C. T.* 1879, '80....	200
do	39	....	1877, '81, '85 & C. T. 1880........	200
do	43	....	1881, '85 & C. T.* 1879, '80........	200
do	44	....	Pur. 1900, '00 & '05	200

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* County Treasurer's sale.

ULSTER COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		HARDENBURGH PATENT, GREAT LOT 7 (*Vernooy's Survey*) — (*Continued*)		
Denning	45	N. part	Purchase 1902	120
do	46		Purchase 1902	200
do	47		Pur. 1900, '00 & '05	200
do	48		1881 & C. T.* 1879	200
do	49		Purchase 1902	200
do	50		Purchase 1902	200
do	51		1881, '85 & C. T.*	200
do	52		1877, '81, '85	200
do	53		1877, '81, '85, & C. T.* 1879, '80	200
do	54		1877, '81, '85 & C. T.* 1879, '80	200
do	55		1881, '85	200
do	57		Pur. 1900, '00 & '05	200
do	58		1877, '81, '85 & C. T.* 1879, '80	200
do	59		1877, '81, '85 & C. T.* 1879, '80	200
do	60		1877, '81, '85 & C. T.* 1879, '80	200
do	61		1877, '81, '85 & C. T.* 1879, '80	250
do	62		1877, '81, '85 & C. T.* 1879, '80	245
do	63		1877, '81, '85 & C. T.* 1879, '80	229
do	64		1877, '81, '85 & C. T.* 1879, '80	221
do	65		1877, '81, '85 & C. T.* 1879, '80	214
do	67		1877, '81 & C. T.* 1879, '80	198
do	68		1877, '81, '85 & C. T. 1879, '80	189
do	69		1881 & C. T. 1879	180
do	70		1881 & C. T. 1879	173
do	71		1877, '81, '85 & C. T. 1879, '80	165
do	72		1881, '85 & C. T. 1879	156

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* County Treasurer's sale, 1879.

ULSTER COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		HARDENBURGH PATENT, GREAT LOT 7, *Vernooy's Survey* — (*Continued*)		
Denning.....	73	....	1877, '81, '85 & C. T. 1879, '80.....	235
do	74	....	1877, '81, '85 & C. T. 1879, '80.....	200
do	75	....	1881, '85 & C. T. 1879, '80........	200
do	79	....	1877, '81, '85 & C. T. 1879, '80.....	1,377
do	80	....	1877, '81, '85 & C. T. 1879, '80.....	1,026
		Total, Vernooy's Survey, 12,790 acres.		
		HARDENBURGH PATENT, GREAT LOTS 7 AND 10, *Darling's 1st Survey,*		
Hardenburgh.	21	S. W. part..................	Pur. 1900 & 1905...	20
do	22	....	Pur. 1900, '00 & '05	160
do	41	....	Purchase 1900.....	160
do	44	....	Purchase 1905.....	160
do	48	The part in Ulster Co..........	Purchase 1899.....	92
do	52	....	Pur. 1900, '00 & '05	226
do	53	....	1877, '81, '85 & C. T. 1879, '80..	221
do	54	....	1877, '81, '85 & C. T. 1879, '80.......	215
do	55	....	Purchase 1905.....	210
		Total, Darling's 1st, Survey, 1,464 acres.		
		HARDENBURGH PATENT, GREAT LOT 8, *Allotment North of Beaver Creek,*		
Shandaken...	3	All in Shandaken..............	Purchase 1909.....	254
Woodstock...	3	All in Woodstock..............	Purchase 1909.....	250
Shandaken...	4	S. E. Corner (Holley)..........	Purchase 1909.....	99.96
Shandaken and Woodstock	5	Beg. at the S. E. cor. of lot 3, in the Goodkill Hollow, th. 5° 30′ W., 1,650 ft., th. S. 6° 18′, E. 1,122 ft., th. S. 28° 18′, E. 750		

ULSTER COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		HARDENBURGH PATENT, GREAT LOT 8, ALLOTMENT NORTH OF BEAVER CREEK— (*Continued*)		
Shandaken and Woodstock	...	ft. to stones th. S. 4° 30′ E. 3,010 ft. to the N. E. cor. of lands of N. Powers, th. S. 55° 15′ W. 1,160 ft., th. N. 37° 48′ W. 264 ft., th. S. 84° 45′ W. along land of D. M. Devall, 660 ft., th. S. 83° 45′ W. along land of W. Miller, 1,320 ft., th. S. 7° 45′ W. long Miller's W. bounds 990 ft., th. S. 79° 45′ W. along N'ly bounds of land of A. D. Ladue 1,188 ft., th. N. 4° 15′ E. 1,887 ft. to stones, th. N. 5° 45′ E. 8,452 ft. to corner of lots 3, 4 and 6, th. S. 53° 30′ E. 3,489 ft. to beg. (Ecker and Hudler).....................	Purchase 1901.....	672
Shandaken...	6	N. W. part (J. H. Simpson).....	Pur. 1906 & 1910...	223
		Total, 1,608.96 acres.		
		Allotment West of Esopus Creek,		
do ...	2	S. W. corner (E. DuBois).......	Purchase 1901.....	124
do ...	2 & 3	Parcel bd. beg. at a bunch of basswood and stones 7c. 501. from center of Cross Mountain Brook on iine of Snyder, th. N. 72° E. 61c. to stones and beech tree; th. S. 27° E. 12c. to stones and beech tree, th. S. 18° E. 17c. to stones on rock th. S. 45° E. 7c. to stones, th. S. 65° E. 7c. to stones, th. N. 18° E. 7c. to a hemlock tree; th. along and around the highest ridge on Cross Mt. S. 48° E. 11ch. to a red oak tree on top of the Mt. th. over the highest ridge of Mt. and along same in a S'ly direction to the S. W. cor. of lot 4,. th. along		

ULSTER COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		HARDENBURGH PATENT, GREAT LOT 8, ALLOTMENT WEST OF ESOPUS CREEK,— (*Continued*)		
Shandaken...	...	line of Great Lots 7 and 8, N. 52° 30′ W. 74c. to a corner of lot 2, th. along line of lot 2, N. 74° 30′ E. 21c. to Cross Mountain Brook, th. down center of said brook about 7c. to a hemlock tree, corner of Edwin Du Bois and John A. Lord, th. S. 45° E. 21c. to tree and stones, th. N. 45° E. 10c. 50l. to a pile of stones and a birch tree, th. N. 3° W. 30c. 50l. to a pile of stones on a rock near a small elm tree, th. N. 36° W. 44c. to beg. (J. A. Lord)	Purchase 1901....	757
do	3 & 4	Parcel beg. in line between Great Lots 7 and 8 of Hard. Pat. at the corner of lots 3 and 4, th. along the highest ridge of Cross Mountain in a N'ly and N. W'ly direction to a corner in line of lots 2 and 3, th. S. 17° 10′ E. 938 ft., th. S. 15° 10′ E. 859 ft., th. S. 62° 10′ E. 900 ft., th. S. 2° 50′ W. 1,138 ft. to a blazed red oak on line of lots 3 and 4, th. S. 14° 10′ E. 300 ft., th. S. 51° 10′ E. 890 ft., th. S. 24° 50′ W. 1,270 ft., th. S. 87° 10′ W. 264 ft., th. S. 58° 20′ W. 2,000 ft. to a stake below the wood lot on E'ly side of Bushkill, in line of John N. Weeks, formerly, th. along said line N. 11° 20′ E. 752.5 ft. to a stake and stones, th. N. 17° 17′ W. 822.4 ft. to a stake 2 ft. W. of a stone about 6 ft. high, th. N. 4° 43′ E. 1,117.5 ft. to		

ULSTER COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		HARDENBURGH PATENT, GREAT LOT 8, ALLOTMENT WEST OF ESOPUS CREEK,— (*Continued*)		
Shandaken...	3 & 4	stones, the N. E'ly cor. of a 27-acre tract conveyed to Andrew L. Weeks, being 264 ft. E. of the center of the Chestnut Bushkill in the line of lots 3 and 4, th. along said lot line S. 74° 50′ W. 3,225 ft. to beg. (A. L. Weeks)..........	Purchase 1907....	400.51
Olive........	5	Parcel beg. at a heap of stones on bounds of Andrew Avery or John E. Weeks, on the line between Olive and Shandaken, th. N. 78° 18′ E. along said line 40c. 70l., th. S. 30° 36′ E. 39c. 9l. to a heap of stones cor. of Joshua P. Davis th. S. 42° E. 8c. 19l. to a pile of stones, th. S. 8° 20′ W. 13c. 4l. th. N. 51° 10′ W. 2c. 4l. to stones, corner of Solomon Hill th. S. 20° 9′ W. 5c. 29l. to stones the S. E. cor. of the Byrnes lot, th. N. 40° 28′ W. 38c. to stones on the mountain, th. S. 49° 9′ W. 22c. 50l. to stones on the E. side of the road the N. E. cor. of the Byrnes lot, th. along said road, to the line of the Andrew Avery farm, th. N. 46° 50′ E. 1c. 81l. to a pile of stones, the S. E. cor. of said farm, th. N. 33° 29′ W. 21c. 62l. to beg. (Boice)....................	Purchase 1906....	163.20
		Total, 1,444.71 acres.		
		DUER TRACT,		
Shandaken...	6	N. W. part (E. R. Longendike)..	Mort. & resale '99.	37.50
do ...	27	....	Purchase 1907....	103.75
do ...	28	....	Purchase 1907....	103.75

Ulster County

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		Hardenburgh Patent, Great Lot 8, Duer Tract— (*Continued*)		
Shandaken...	29	N'ly ½........................	Purchase 1906....	51.55
do ...	30	N'ly ½........................	Purchase 1906....	53.50
do ...	37	....	Purchase 1911....	104
do ...	38	....	Purchase 1910....	112
do ...	45	....	Purchase 1910....	119
do ...	46	....	Purchase 1910....	118
		Total, Duer Tract, 803.05 acres.		
		Lausette Tract,		
do ...	...	German Society Lot...........	Appropriated 1918.	322
do ...	28	N. E. cor. 19.26c. N'ly & S'ly and 3.50c. E'ly & W'ly..........	Appropriated 1918.	7
do ...	29	N. ½........................	Appropriated 1918.	86
do ...	30	....	Purchase 1900, appropriated 1918 & 1905.........	160
do ...	31	....	Purchase 1900, appropriated 1918 & 1905.........	168
do ...	32	....	Purchase 1900, appropriated 1918..	160
do ...	39	....	Appropriated 1918.	156
do ...	40	....	Appropriated 1918.	160
do ...	41	....	Appropriated 1918.	146
do ...	42	....	Purchase 1900 & appropriated '18	163
do ...	43	E'ly part....................	Appropriated 1918.	80
do ...	44	N. E. part 44a. and N. W. part 52a.......................	Pur. 1907 & appropriated 1918....	96
do ...	45	S. E. part....................	Appropriated 1918.	46
do ...	56	S. E. part....................	Appropriated 1918.	106
do ...	57	....	Appropriated 1918.	140
do ...	58	....	Appropriated 1918.	140
do ...	59	....	Appropriated 1918.	152
do ...	68	....	Appropriated 1918.	162
do ...	69	....	Appropriated 1918.	150
do ...	70	....	Appropriated 1918.	138
do ...	71	S. E. part....................	Appropriated 1918.	84

ULSTER COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		HARDENBURGH PATENT, GREAT LOT 8, LAUSETTE TRACT—(*Continued*)		
Shandaken...	84	S. E. part S. of road...........	Appropriated 1918.	80
do ...	85	S. part........................	Appropriated 1918.	158
do ...	86	E. S. & W. parts..............	Appropriated 1918.	140
do ...	100	N. W. part ex. so much as is E. of Railway....................	Appropriated 1918.	36
do ...	101	S. E. part W. of Railway........	Appropriated 1918.	72
do ...	102	N. W. part S. of Landon road...	Appropriated 1918.	26
		Total 3,334 acres.		
		Sherwood or Joanna Livingston Tract, (Peter R. Livingston Allotment)		
do ...	.....	H. D. H. Snyder land beg. at a hemlock and stones marked P. R. L. D. H. B. 1833, in line between Great Lots 7 and 8, Hard. Pat., where it intersects the line between the Johanna Livingston Tract, and the Peter R. Livingston Tract th. N. 35° 30′ E. 36c., th. N. 56° W. 46c. 21l. to stones with trees, th. S. 35° 30′ W. 16c. to a hemlock tree at S. E. cor. of the Harrington lot, th. N. 56° W. along said lot 50c. to a hemlock sapling against Fork Ridge, th. N. 35° 30′ E. along said Harrington lot and the Larkin lot 40c. 50l. to a stump and stones, th. S. 52° 30′ E. 49c. to stones near a beech tree, on line of the Lord lot, th. N. 35° 30′ E. 25c. to Beech & Woodworth's 600a. lot, th. N. 56° W. along said 600a. lot and the 76a. lot sold Beech & Woodworth 22c., th. N. 26° E. along line of said parcel 62c. to the line of Beech		

Ulster County

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		Hardenburgh Patent, Great Lot 8, *Sherwood or Jeanna Livingston Tract*—(*Continued*)		
Shandaken...	...	& Woodworth's 600a. th. N. 56° W. along same 22c., th. N. 34° E. along same 29c., th. N. 55° 40′ W. 32c. to center of Painter Kill, th. following the course of said Kill, W'ly as it winds and turns, 27c. to a hemlock tree, cor. of the 44a. sold to P. Conway, th. S. 16° W. along Conway's lot 20c. to a cluster of beeches, th. N. 74° W. along said lot 22c. to stones in old bark road 20l. from a hemlock tree, th. N. 16° E. 20c. and across the Painter Kill to basswood and stones in line of Pat Conway's 75a. lot, th. N. 74° W. 12½c. to line of John Conway, th. S. 15° 15′ W. 12c., th. N. 75° W. 77c. 20l. to a heap of stones and birch tree, th. N. 15° 15′ E. 42c. to a heap of stones and brush, th. S. 75° E. 99c. 4l. to two hemlocks, th. S. 15° W. 8½c. to the cor. of the Kelsey lot, th. N. 84° 20′ E. along the Kelsey lot 20c. th. S. 55° 40′ E. (in 1851) 30c. to the bounds of the Longyear 98a. lot, th. N. 34° 20′ E. 35c. and across the Muddy Brook, th. N. 56° W. 20c. to Longyear 110a. lot, th. S. 34° W. 5½c. to the Muddy Brook, th. N. W'ly along Brook, as it winds and turns, 21c. to the bounds of Cullen's 80a lot, th. S. 34°		

ULSTER COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		HARDENBURGH PATENT, GREAT LOT 8, *Sherwood or Joanna Livingston Tract* — (*Continued*)		
Shandaken...	...	W. along the bounds of the Cullen lot about 1c., th. N. 56° W. along bounds of Cullen 20c. to the J. Murray lot, th. N. 55° 30′ W. along lot of J. Murray 64c. to maple tree and stones, th. S. 34° W. 10c. 68l., th. N. 56° W. 4c., th. S. 65° W. 63c. to stones and birch tree marked S. W. 1850, th. S. 34° W. 156c. to line of Great Lot 7, th. S. 56° E. 305c. to beg...........	Purchase.........	4,259.65
do ...	.....	H. D. H. Snyder land bd. beg. on line bet. the Johanna Livingston Tract and the Peter R. Livingston Tract, at a point about 156c. 50l. N. 34° E. from the line bet. Gt. Lots 7 & 8, and being also a cor. of the 102a. sold to Beech & Woodworth, th. N. 14° W. 36c. 75l. to the Beech & Woodworth 600a. lot, th. N. 34° E. along said 600a. lot 25c., th. N. 56° W. along said 600 a. lot, 30c. to the bounds of the H. D. H. Snyder 248a. lot, th. N. 14° W. 55c. through the 248a. lot of H. D. H. Snyder to the W'ly line thereof, th. N. 34° E. along W'ly line of said 248a. lot about 25c., th. S. 56° E. along the line of said 248a. lot 40c. to bounds of Christian Winne lot, th. S. 34° W. along Winne lot about 10c. to a corner thereof, th. S. 12° E. along Winne lot 84c. to		

ULSTER COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		HARDENBURGH PATENT, GREAT LOT 8, *Sherwood or Joanna Livingston Tract*—(*Continued*)		
Shandaken...		line bet. the Joanna Livingston Tract and the Peter R. Livingston Tract, th. S. 34° W. along said line 44c. to beg..........	Purchase 1902....	419
do ...	...	Joseph H. Riseley parcel beg. at a heap of stones on Eli Whitney's line; th. N. 50° 30′ W. 48c., th. N. 39° 30′ E. 18c., th. N. 50° 30′ W. 20c., th. N. 39° 30′ E. 3½c., th. N. 50° 20′ W. 41c., th. S. 39° 30′ W. 36c., th. S. 15′ E. 3c. 5l., th. S. 10° E. 5½c., th. S. 6° 30′ W. 1c. 32l., th. S. 12° E. 3c. 70l., th. S. 44° 30′ E. 7c. 86l., th. S. 61° 5′ E. 36c. 7l., th. S. 43° 7′ E. 12c., th. S. 30° 7′ E. 15c., th. S. 80° 7′ E. 5½c., th. N. 78° 53′ E. 31c. to beg............	Purchase 1906....	359
do ...	...	Sherrall lot (N. W. cor. of Livingston Tract), 2,425 acres ex. 81a. S. W. part N. of Curran Bushkill (Cornell Estate).....	Purchase 1920....	2,344
		Joanna Livingston or Sherwood Tract — (Peter R. Livingston Allotment) (*D. H. Burr's Survey*)		
do ...	3	Coons, Edward, situated at Fox Hollow; bd. N. by the U. & D. R. R., E. & S. by land of Mrs. Peck and W. by land of Mrs. Dutcher....................	1905.............	1.00
do ...	20, 21 22 & 23	All in the Joanna Livingston Tract of land bd. beg. at a heap of stones, the S. E'ly cor. of 870a. Tannery lot, and in E'ly line of lot 23, th. S. 38° W. 15c. 17l. to stones around a hem-		

ULSTER COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		HARDENBURGH PATENT, GREAT LOT 8, *Joanna Livingston or Sherwood Tract* — (*Peter R. Livingston Allotment*) — *Burr's Survey* — (*Continued*)		
Shandaken...	20,21, 22 & 23	lock tree, th. S. 31° 30′ E. 18c. to a heap of stones near a ledge, th. N. 87° 30′ E. 51c. to a heap of stones nearly on top of the mountain, th. N. 30′ W. 33c. 751. to a heap of stones in S'ly line of lands of Simon Holley, th. along said line N. 52° W. 56c. to stones on a ledge, th. N. 38° E. 2c. to stones on the edge of a ledge, the S. E'ly cor. of lands of Edward Keator, th. along Keator's lands N. 52° W. 7c. 751. to a birch tree, th. N. 38° E. 8c. 401. to stones, th. N. 52° W. 7c. 251. to stones, th. N. 23° 30′ E. 6c. to stones, the. S. E'ly cor. of lands owned or occupied by Mrs. DuBois, th. along same N. 29° 30′ W. 26c. to stones in E'ly line of lands now or formerly of Isaiah Hill, th. along same S. 23° 30′ W. 7c. to stones. th. N. 72° 30′ W. 7c. 501. to stones. th. S. 38° W. 18c. 501. to stones, th. N. 74° 30′ W. 6c. 501. to stones, th. N. 65° W. 6c. 501. to stones near a rock in N'ly line of James Kinkade, th. along same S. 52° E. 11c. to S. E'ly cor. of Kinkade, th. along same S. 38° W. 29c. to a stake and stones in N'ly line of Maria B. Newton, th. S. 50° E. 67c. 501. to beg. (ex. a spring of water Sold Phoenicia Water Works Co.) (J. H. Simpson)..	Pur. 1906 & 1910..	211.70

ULSTER COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		HARDENBURGH PATENT, GREAT LOT 8, *Joanna Livingston or Sherwood Tract — (Peter R. Livingston Allotment) — Burr's Survey — Continued*).		
Shandaken...	22 & 23	Bd. beg. at a pile of stones on line between John A. Lord and the Beech and Woodworth 600a. lot, th. N. 56° W. 11c. 30l. to a corner, th. S. 33° W. 31c. to stones on S. line of John Larkins' farm, th., S. 51° E. 25c. to stones, th. N. 30° E. 12c. to stones on top of a ridge, th. N. 25c. to beg. (John A. Lord).............	Purchase 1901....	67
do ...	23	Parcel (Mary L. Newman) beg. in the Livingston line on the line bet. land of Wood and land of Bernstein on iron pipe about 125 ft. from the road below the house of Wood, th. S. 38° W. along said Livingston line 4,900 ft. to the height of ground below a rocky hill on the summit of the mountain, th. N. 5° W. along the height of ground and passing through Bear Point, a distance of 3,585.10 ft. to lands of Thomas McGrath; th. N. 38° E. 1813.50 ft. to the S. W'ly cor. of the forty acre lot of B. Frank Wood; th. along said Wood's bounds S. 52° E. 1,387 ft. to stones 5 ft. S. 52° E. from a chestnut tree; th. N. 38° E. 507.51 ft. to stones on the E'ly slope of hill; th. S. 52° E. 1,103.51 ft. to beg...........	Pur. 1909 & 1910..	190.20
		Total, Sherwood or Livingston Tract, 7,851.55 acres.		

ULSTER COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		HARDENBURGH PATENT, GREAT LOT 8 — (*Continued*) *Torron's Hook Allotment,*		
Olive........	2	All in Great Lot 8 of land described as beg. at a pile o'stones, on S. side of a red oak, on S'ly side of Torron Hook Mountain, on N'ly line of Marbletown and 23c. 50l. W'ly from the intersection of Marbletown line with the S. W'ly line of Hurley Patentee Woods, being a large flat stone in a large pile of stones, th. N. 89° W. along N'ly line of Marbletown 30c. 9l. to a pile of stones, th. N. 15° 35′ W. 16c. 19l. to a pile of stones, th. N. 20° 28′ W. 9c. 86l. to stones around a chestnut tree, th. N. 87° 45′ E. 6c. 5l. to a point, th. N. 70° 15′ E. 6c. 93l., th. S. 90° E. 10c. 91l. to a chestnut tree, th. S. 25° E. 9c. 94l. to a chestnut tree, th. S. 54½° E. 5c. 56l. to a birch tree standing on a rock, th. N. 80° 30′ E. 12c. 37l. to a pile of stones near a quarry and a point on the S. W'ly line of lot 1, 2d Allotment, Hurley Patentee Woods, th. N. 51° 31′ E. 22c. 10l. to a rock oak tree, th. S. 30° 45′ E. along N. E'ly line of said lot 1, 13c. 11l. to a pile of stones, th. S. 47° 45′ W. 21c. 36l. to a pile of stones, the S. W'ly cor. of said lot 1, and th. S. 65° 40′ W. 17c. 96l. to beg. (Z. P. Boice)	Purchase 1906....	96.80
		HARDENBURGH PATENT,, GREAT LOT 9, (*Beekman Tract*)		
Hardenburgh.	32	....	1877, '81, '85, '95, & C. T.* 1879, '80............	156

ULSTER COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		HARDENBURGH PATENT, GREAT LOT 9, *Beekman Tract* — (*Continued*)		
Hardenburgh	33	....	1871, '77, '81.....	156
do	34	....	1871, '77, '81.....	156
do	35	....	1877, '81, '85 & C. T. 1879, '80*...	156
do	36	....	1877, '81, '85 & C. T. 1880........	156
do	40	....	1881, '85, & C. T.*	156
do	41	....	1881, '85, & C. T.*	156
do	42	....	Purchase 1907....	156
do	47	....	Purchase 1907....	156
do	48	....	Purchase 1907....	156
do	56	All in Hardenburgh...........	1877, '81, & C. T.*	75
Denning.....	56	S. end across.................	Purchase 1907....	70
Hardenburgh.	57	All in Hardenburgh...........	1877, '81, & C. T.*	75
Denning.....	57	S. pt. or S. W. ½ in Denning....	1877, '81 & C. T.*	75
do	58	All in Denning...............	Purchase 1907....	78
Hardenburgh.	58	All in Hardenburgh...........	Purchase 1907....	78
Denning.....	59	....	1877 & C. T.* 1879	156
do	60	....	1877 & C. T.* 1879	156
do	61	....	1877, '81 & C. T.*	320
do	62	....	Purchase 1899....	160
do	63	....	Purchase 1900....	222
		Total, Great Lot 9, 3,025 acres.		
		HARDENBURGH PATENT, GREAT LOT 10,		
Hardenburgh.	...	Bd. N. E'ly by Great Lot 7, S. E'ly by Town of Denning, S. W'ly by Great Lot 9, and W. by Jarvis Tract............	1877, '81 & C. T.*	912
Denning.....	...	Bd. N. by a 1,325a. lot, E. by Vernoy's Survey, S. by Beekman Tract and W. by town of Hardenburgh..............	Purchase 1899....	864
		Jarvis Tract,		
Hardenburgh.	1	....	Pur. 1900 and 1900, '05...........	100
do	3	....	Pur. 1900 and 1900, '05...........	100

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* County Treasurer's sales, 1879.

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		HARDENBURGH PATENT, GREAT LOT 10, *Jarvis Tract*—(*Cont'd*)		
Hardenburgh	5		1881, '85	100
do	6		1881, '85	100
do	7		1881, '85	100
do	8		1881, '85	100
do	9	W'ly ½	Purchase 1900	50
do	11		1885	100
do	12		1885, '90	100
do	13		1881, '85	100
do	14		1881, '85	100
do	15		1881, '85 & C. T. 1879	120
		Total, Great Lot No. 10, 2,946 acres.		
		HARDENBURGH PATENT, GREAT LOT 25,		
Woodstock	87	All in Ulster Co	Purchase 1917	50.00
		HARDENBURGH PATENT, GREAT LOT 26, *Division* 4,		
Saugerties	...	W'ly end of all in Ulster Co	Purchase 1909	183.64
		Divisions 6 *and* 7,		
Woodstock	17		Appropriated 1918.	112.20
do	18	All in Ulster Co	Appropriated 1918.	100.70
do	19	All in Ulster Co	Appropriated 1918.	13.30
do	25	All in Ulster Co	Appropriated 1918.	14.40
do	26	All in Ulster Co	Appropriated 1918.	90.30
do	27		Appropriated 1918.	110.10
do	28		Appropriated 1918.	110.10
do	33	All in Ulster Co	Appropriated 1918.	28.90
do	34	All in Ulster Co	Appropriated 1918.	91.10
do	35		Appropriated 1918.	108.90
do	36		Appropriated 1918.	118.20
do	37		Appropriated 1918.	117.00
do	42		Appropriated 1918.	103.60
do	43		Appropriated 1918.	110.10
do	44	W. ½	Appropriated 1918.	53.40
do	45	W. ½	Appropriated 1918.	61.80
do	46	W. ½	Appropriated 1918.	61.90
		Total, Great Lot 26, 1,589.64 acres.		

ULSTER COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		HURLEY COMMONS,		
Hurley	6	Quarry lot, bd. N. & W. by U. & D. R. R. and S. E. by U. & D. Stone Road and S. & S. W. by Wallace Lee, et al	1900	1.75
do	13	Tiffany, bd. N. by John Pink, E. by Silas Edmonds, S. by Geo. Sipperly and W. by Enoch Schoonmacher	1915	8.50
Rosendale	45		1895, '00	28
do	67		1895	27
		Total, 65.25 acres.		
		HURLEY PATENTEE WOODS, 1ST ALLOTMENT, *Great Lot* 1,		
Hurley	...	Parcel described as, beg. at a white oak tree on bounds of Solomon D. Crispell and Gardiner Smith between Great Lots Nos. 1 and 2, and running th. S. 29° W. 4c. 88l. to a white oak and stones, th. S. 7¼° E. 2c. to a large rock, th. S. 17° W. 2c. 77l. to a hemlock tree, th. S. 23¼° W. 2c. 26l. to a pine tree on bounds of Mrs. William A. Teal, th. N. 43° W. 54c. 40l. to a small rock about 4c. N. W. from a falls, th. N. 47° E. 12c. 40l. to a hickory tree, th. S. 42° E. 49c. 50l. to beg., containing 60½a. more or less, ex. 1.15a. sold by S. D. Crispell to Gardiner Smith in 1860, 2.02a. sold to David DuBois in 1860, and 8.46a. sold to David Du Bois in 1861. (Part of Solomon D. Crispell farm)	Mortgage & resale 1907	48.87

ULSTER COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		HURLEY PATENTEE WOODS, FIRST ALLOTMENT, *Great Lot 1 — (Continued)*		
Hurley......	...	Coutant, Charles; b'd. N. E. by McAuliff and road from Ennist's to Marbletown line, S. E. by Ten Eyck, S. W. by Marbletown line and N. W. by George Scriber..............	1915.............	98.00
		Great Lot 2,		
do	1, 2, 3, 4 & 5	A parcel being the E'ly part of lots 1, 2 and 3, and beg. at the foot of the hill on bounds of Great Lots 1 and 2, th. along same N. 40° W. 28c. 40l. to a rock oak tree on bounds of John M. Myer, Jr., th. N. 50° E. 6c. 80l. to a rock oak croached tree on the bounds of Egbert Houghtaling, th. along same S. 40° E. 31c. 20l. to the foot of the hill, th. along the same S. 77° W. 1c. 70l., th. S. 86° W. 23l. S. 41° W. 2c. 25l. to beg., containing about 16½a, ex. of so much of the 6th Allotment as is therein. A parcel being the S. E. part of lot 4 and beg. at the foot of the hill on the N. E. side of lot No. 3, th. N. 44° 54′ W. to the 6th allotment, th. N. 46° E. 2c. 80l. to the S. W. line of lot No. 5, th. S. 44° 38′ E. along lot No. 5 to the foot of the hill, th. along the same to beg., containing about 3a. A parcel being the S. E'ly part of lot 5 beg. at the foot of the hill at a marked walnut sapling 5, 6 and runs N. 44° 22′ W. 34c. 43l. to a stake and stones th.		

ULSTER COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		HURLEY PATENTEE WOODS, 1ST ALLOTMENT, GREAT LOT 2—(*Continued*)		
Hurley......	1, 2, 3, 4 & 5	S. 46° W. 2c. 24l. to stones around a white oak sapling then S. 44° 38′ E. 34c. 43l. to the foot of the hill and th. N. 42° 30′ E. 2c. 21l. to beg., containing 6 acres exclusive of the 6th. Allotment; excepting from the three above described parcels, about 3 acres sold by S. D. Crispell to Gardiner Smith in 1860 described as being the extreme E'ly ends of lots 1, 2, 3, 4 & 5 and beg, at a heap of stones on the line between Great Lots 1 and 2 of the First Allotment on the top of the hill and runs th. E'ly on or near the top of the hill to the bounds of George P. Newkirk then S'ly along his bounds to the foot of the hill then W'ly and N. W'ly along the bounds of Smith to beg., containing 3 acres, more or less. (Part of Solomon D. Crispell Farm)...	Mortgage*........	22.50
do	7	E'ly part. (Part of Solomon D. Crispell Farm)..............	Mortgage*.......	10
do	8 & 9	Ex. 60.50 acres sold by S. D. Crispell to Edgar B. Newkirk, being the W'ly ends of the lots and ex. 6 acres beg. at foot of the mountain running a N. W'ly direction 12c. along lands formerly of Philip Newkirk (in possession of S. D. Crispell in 1852) th. a S. W'ly direction 5c. along land of Judith DuBois (formerly), th. a S. E'ly direction 12c. along		

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* Resale, 1907.

ULSTER COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		HURLEY PATENTEE WOODS 1ST ALLOTMENT, GREAT LOT 2—(*Continued*)		
Hurley......	8 & 9	land formerly of Hyman Roosa th. a N. E'ly direction along the foot of said mountain to beg., 5c. (Part of Solomon D. Crispell farm)...............	Mortgage*........	9
do	10, 11 & 12	The S'ly part of lot 10 being all that part of the lot up to the N. W'ly cor. of the Seventh Allotment, containing after deducting the Sixth Allotment, 6.37 acres, more or less. Also a parcel beg. at the W. cor. of said aforesaid conveyed parcel and runs th. N. 40° W. 17c. 10l. to a stone heap and th. N. 50° E. 2c. 10l. to a stone heap on line of lot No. 11, th. S. 40° E. 17c. 10l. to said lot then S. 50° W. 10c. and 10l. to beg. containing 3.85 acres more or less. (In lot 10). The S. E'ly part of lot 11 beg. at lot No. 10, at the foot of the hill near lands of John M. Myer, Jr. th. N. 40° W. 14c. 42l. to the Sixth Allotment and then after crossing Sixth Allotment the same course 6c. and 80l. to Seventh Allotment then along Seventh Allotment S. 51½° E. to the angle formed by the Sixth and Seventh Allotments, then along Sixth Allotment S. 26° W. 1c. 54l., then across Sixth Allotment S. 40° E. 4c. then N. 26° E. along Sixth Allotment 2c. 48l. to a heap of stones and then S. 40°		

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* Resale, 1907.

ULSTER COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		HURLEY PATENTEE WOODS, 1ST ALLOTMENT, GREAT LOT 2—(*Continued*)		
Hurley......	10, 11 & 12	E. 14c. 42l. to the foot of the hill and th. S. 45° W. 2c. 48l. to beg., containing 4.81 acres. The S. E'ly end of lot 12 bounded S. W'ly by lot 11, N. W'ly by Sixth Allotment and N. E'ly by Seventh Allotment about 2 acres. ex. from the above described lands in lots 10, 11 and 12, land sold by S. D. Crispell to John G. Bell in 1857, beg. at the foot of the hill on the bounds of George P. Newkirk between lots Nos. 9 and 10, th. along said bounds to the top of the high hill at the ledge of rocks th. along said rocks to the Seventh Allotment th. along to the foot of the hill to the place of beg., being the S. E. part of lots Nos. 10, 11 and 12. (Part of Solomon D. Crispell farm)..	Mortgage*........	11
		Great Lot 3,		
do	1	Land in the S. E'ly end of Lot No. 1 beg. at the N. E. cor. of Lot No. 1, th. N. 39° W. 18c., th. S. 44° W. 7c. to the cor. of a lot of land of the Heirs of Jonathan Hasbrouck (7th Allotment), th. S. 53° E. 20c. and 70l. to lands lately of Judith and Dinah Dubois and th. to place of beg. (Part of Solomon D. Crispell farm)...	Mortgage* & 1915.	9.25
do	2	E'ly part bd. N. W'ly by land of James Rourk. (Part of Solomon D. Crispell farm).......	Mortgage* & 1915.	124

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* Resale, 1907.

ULSTER COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		HURLEY PATENTEE WOODS, 1ST ALLOTMENT, GREAT LOT 3—*(Continued)*		
		West ½,		
Hurley	...	Bd. N. E. & N. W. by res. lands of heirs of Geo. Shaw & S. E. & S. W. by lands of Henry Crasser or Crosier	1900, '05	2
		Great Lot 4,		
		East½,		
do	1	Bd. N. E. & S. W. by lot lines, S. E. by McMullen road & N. W. by lands of Thos. Cornell Est.	1900	11
do	1	Parcel, b'd N. E. & S. W. by lot lines, S. E. by land of G. C. Woolsey, N. W. by Dumond.	1910, 1915	45
		Great Lot 5,		
		Subdivision 4,		
		(Bulger's Survey)		
do	8	N. E. part; bd. S. W. by land of C. B. Bushnell	1900	14.80
		Subdivision 5,		
do	.....	Bd. N. E. & S. W. by lot lines S. E. by land of S. C. Wynkoop & N. W. by land of A. Ten Eyck	1895, '00	63
		Great Lot 6,		
do	2	Bd. N. E. & S. W. by lot lines S. E. by land of Dennis Connell and N. W. by School Dist. No. 9	1900	4
do	15	Kinney place, b'd N. E. by John Purcell, S. E. and N. W. by John Doland and S. W. by P. A. Canfield	1915	3.50
do	16	Handrahan place or Henderhan, Thomas, place; b'd N. E. by lands of John Purcell,		

ULSTER COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		HURLEY PATENTEE WOODS, 1ST ALLOTMENT, GREAT LOT 6—(*Continued*)		
Hurley......	16	S. E. by Palmer or Palmer A. Canfield, S. W. by Julius Osterhoudt & N. W. by Mary Chambers..................	1905, '10.........	10
do	30 & 31	S. E. and bd. N. E. by Burger Est., S. E. by lot 20, S. W. by Wm. Eckert or heirs, and N. W. by the U. & D. Stone road	1900, '05.........	4
		Great Lot 8, *East* ½		
do	5	....	1895, '00.........	14.50
do	6	....	1900, '05.........	28.75
do	7	Small lot.....................	1895, '00, '10.....	15.50
		West ½		
do	7	....	1900, '05.........	69.25
		Great Lot 9,		
do	...	Brown, James, Heirs of; Bd. N. E. by J. Simpson, S. E. by Morgan Hill road & S. W. & N. W. by T. Coogan.........	1895.............	.13
do	...	Part of Gore lot & pt. of W. Van Aken lot, bd. E. by Town line, S. W'ly by Benj. J. Newkirk & N. W. by Phillip V. D. Lockwood....................	1871.............	12.00
do	...	Bd. N. E. & S. E. by Timothy Bahan, S. W. by U. & D. Plank Road & N. W. by Wm. Mulligan......................	1890, 1895........	.13
do	...	Bd. N. E. by 22d Allotment, S. E. by line of S. D. No. 4, S. W. by G't lot 8 & N. W. by State...	1895, '00.........	126
do	...	Bd. N. E. by James Simpson, S. E. by Morgan Hill road, S. W. by Mary Lynch and N. W'ly by Mulligan................	1900.............	.50

ULSTER COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		HURLEY PATENTEE WOODS, 1ST ALLOTMENT, GREAT LOT 9 — (*Continued*)		
Hurley......	...	Bd. N. E. by the U. & D. R. R. and the Est. of Wm. Mulligan, S. E. by John Fanning, S. W. by U. & D. Stone road and N. W. by Coogan Est...........	1900.............	.50
do	...	Bd. N. E. by Timothy McCarthy, S. E. by road leading from U. & D. Stone Road to Vandale, S. W. by the U. & D. R. R. and N. W. by John Murphy..	1900, '05.........	1.50
do	...	Bd. N. E. by Margaret Cully, S. E. by by a land running from U. & D. Stone road, S. W. by John Van Aken and N. W. by Coogan Est.................	1900.............	1.00
		HURLEY PATENTEE WOODS, 2D ALLOTMENT,		
Olive........	1	All of the following described land in the 2d Allotment beg. at a pile of stones, on S. side of a red oak, on S'ly side of Torron Hook Mountain, on line of		
do	...	Marbletown and 23c. 50l. W'ly from intersection of Marbletown line with the S. W'ly line of Hurley Patentee Woods, said point being a large flat stone in a large pile of stones, th. N. 89° W. along N'ly line of Marbletown 30c. 9l. to stones, th. N. 15° 35′ W. 16c. 19l. to stones, th. N. 20° 28′ W. 9c. 86l. to a chestnut tree, th. N. 87° 45′ E. 6c. 5l. to a point, th. N. 70° 15′ E. 6c. 93l., th. S. 90° E. 10c. 91l. to a chestnut tree, th. S. 25° E. 9c. 94l. to a chestnut tree, th. S. 54½° E. 5c. 56l. to a birch tree, th. N. 80° 30′ E. 12c. 37l. to stones by a ledge of		

ULSTER COUNTY

Town	Lot	DESCRIWTION	Source of title and tax sale	Acres
		HURLEY PATENTEE WOODS, 2D ALLOTMENT—(*Continued*)		
Olive........	1	rocks near a quarry on the S. W'ly line of lot 1, th. N. 51° 31' E. 22c. 10l. to a rock oak tree, th. S. 39° 45' E. along N. E'ly line of said lot 1, 13c. 11l. to stones, th. S. 47° 45' W. 21c. 36l. to stones, being the S. W'ly cor. of said lot 1, and th. S. 65° 40' W. 17c. 96l. to beg. (Z. P. Boice)................	Purchase 1909.....	29.70
		HURLEY PATENTEE WOODS, 6TH ALLOTMENT,		
Hurley.......	...	All. (Part of Solomon D. Crispell farm)......................	Mortgage*........	8.00
		HURLEY PATENTEE WOODS, 7TH ALLOTMENT,		
do	...	All. (Part of Solomon D. Crispell farm)......................	Mortgage*........	30.25
		Total, Hurley Patentee Woods, 827.63 acres.		
		HURLEY, TOWN OF,		
do	...	Kauss, August, house and lot....	Escheat 1916......	.37
		KINGSTON COMMONS, *Binnewater Class*,		
Kingston.....	1	Candee & Krekler or Real Construction Co.; bd. N. by Mrs. Thomas Grant, E. by lot 13, S. by A. B. Hasbrouck and W. by U. & D. R. R...............	1915.............	29
do	2	Candee & Krekler, bd. N'ly. by lot 13, E'ly by lot 14, S'ly. by lot 1 and W'ly by N. W'ly part lot 2......................	1915.............	13
do	4	Candee & Krekler, bd. N'ly. by lot 5, E'ly. by lot 16, S'ly. by lot 3 and W'ly by N. W'ly. part of lot 4....................	1915.............	18

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* Resale, 1907.

ULSTER COUNTY

Town	Lot	DESCRIWTION	Source of title and tax sale	Acres
		KINGSTON COMMONS, *Binnewater Class* — (*Continued*).		
Kingston	13	Brophy, Michael; bd. N. and E. by Michael Lamb, S. by E. Cusack and W. by U. & D. road	1915	.50
do	13	Madden, Mrs. Patrick or Catherine Cumings; bd. N. by E. Sweeney & Son, E. by Susan Fitzpatrick, S. by U. & D. plank road & W. by Katherine Murtha	1900, '05	3.00
do	13	Haggerty, James; bd. N. by Mrs. Edward Brophy, E. and S. by Mary Cunningham and W. by Jas. Brophy	1905, '10	.50
Woodstock	20		1895, '00	30
do	21		1895	45
Kingston	25	Ex. 12.75a. beg. at the center of K. and D. plank road, th. N. 24° 20c. E., 481. to a cor. of a heap of stone, th. along lot 26, N. 60° W. 6c. to a cor. of a heap of stone, 31. N. W. from a pitch pine tree, th. S. 24° W. 21c. 421. to center of said road, th. down center of road as it winds and turns to the place of beg., being the N. E'ly portion of lot No. 25	1895, 1900 & conveyed 1913	33.25
do	38	Schoonmaker	1915	30
Woodstock	44	Sheehan	1915	30
Kingston	50	Candee & Krekler	1915	30.75
do	52	Ryan, Mrs. James; (Casey property)	1915	30.75
do	60		1881, '85 & C. T., 1879, '80	30
do	61		1895, '00	45
do	64		1905, 1910	29.75
do	68	Candee & Krekler, N. part of lot.	1915	14
do	74		1905, 1910	30.75
do	75		1895, '00	46

ULSTER COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		KINGSTON COMMONS, *Binnewater Class* — (*Continued*)		
Kingston.....	76	....	1905, 1910........	20.50
do	82	Candee & Krekler; bd. N'ly by lot 33, E'ly by Sawkill and land of Coykendall, S. by lot 81 and W'ly by lot 70........	1915.............	19
do	84	....	1880, '81, C. T. '80.	30
do	86	....	1900, '05..........	30
do	87	....	1895, '00..........	45.90
do	96	Candee & Krekler.............	1915.............	20
do	97	....	1895, '00..........	45
do	98	Walker, Peter or Heirs.........	1910, 1915........	30
do	99	....	1895, '00, '05......	45
do	101	....	1890, '95..........	45
do	102	Candee & Krekler.............	1915.............	30
do	107	Butler, Mrs. Patrick; bd. N. by 108, E. by Mrs. D. Neenan or Mrs. B. Leahy, lot 119, S. by Arthur Britt and W. by S. D. Coykendall, lot 95...........	1915.............	15
do	108	Butler, Mrs. Patrick...........	1915.............	30
do	111	....	1900, '05..........	45
do	113	....	1895, '00..........	45.40
do	114	....	1890, '95, '05......	40
do	116	Burns, Patrick; bd. N. by lot 117, E. by Joseph Regor, S. by Sawkill and W. by Lewis Hulschair..........................	1915.............	1.00
do	125	....	1895, '00..........	45
do	126	Candee & Krekler.............	1915.............	30
do	128	....	1905, 1910........	30
do	130	Hickey, Owen, widow of, or heirs bd. N. by heirs of John Neenan or Mary Murray and J. Haggerty, E. by heirs of John Murray, S. by John Starr or heirs of Mrs. John Neenan and W. by Mrs. Daniel Neenan....	1905, '10..........	1
do	131	S. part, Patrick Haggerty, heirs of; bd. E. S. and W. by lot lines and N. by James Haggerty....	1905, 1910........	22.70
do	148	....	1890, '95..........	30

ULSTER COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		KINGSTON COMMONS—(*Continued*)		
		Clove Class		
Kingston	8	Spaulding, John H.	1915	44
do	18	S. ½	1910, 1915	11
do	45	Hayes, William	1910, 1915	6
		Compensation Class,		
Ulster	15		1877	10
		First Class,		
Kingston	73		1905	44.90
do	88		1900, '05	30
do	89	E. or S. E. ½	1900, '05	15
		Flatbush Class,		
Ulster	6		1915	30
do	47	S. ½	1915	15
		Second Class,		
Saugerties	49		1900, '05	45
		South West Class,		
Woodstock	98	Sub. 4, A. and W. Wolven	1905	7
		Three Mile Class,		
do	15	Solomon Peters; bd. N. by L. Hoyt, E. by F. Happy and S. and W. by Adolph Omhay	1915	15
do	20	E. V. W. Schoonmaker	1915	45.90
do	25		1877	29.70
		Total, Kingston Commons, 1,553.25 acres.		
		LAKE'S PATENT,		
Plattekill	...	Lewis, Geo. W., bd. N. and W. by F. Bayler, E. by G. Birdsall, & S. by Gilberts	1881, '85 & C. T.'79	2
do	...	Staples, Lewis, bd. N. by H. or J. Sutton, E. by Wm. Pembrook, S. by G. Thorne, & W. by H. Sutton	1881, '85 & C. T.'79	5
		Total, 7 acres.		

ULSTER COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		MARBLETOWN COMMONS, TRUSTEE ALLOTMENT, *Subbeatty Mountain*, *Letter B*,		
Olive	12		1871, '77	28
do	19	N. Part	1871, '77	19
		Total, 47 acres.		
		MARBLETOWN, TOWN OF		
Marbletown	...	Fiere, Joseph; bd. N. by James Green, E. and W. by Joseph Yeaple, and S. by N. Y. City Aqueduct property	1915	1.00
do	...	Hasbrouck, Jacob, lot, bd. N. & E. by John H. Hasbrouck and S. & W. by Peter G. Wager	1900	4
do	...	Jansen, Garret lot, bd. N. & E. by Alex. S. Markle, S. by Catherine Broadhead or Thos. Sampson, and W. by Broadhead or Sampson	1900, '05	1.50
do	...	Krom, John J., lot, bd. N. by James P. Vandermark, E. by highway and S. and W. by John Krom	1900, 1905	.50
do	...	Patterson or Peterson, Baxter; bd. N. by Du Bois, Markle or Yaple, E. by Joseph Yaple or the N. Y. City Aqueduct line and W. by same	1915	1.00
do	...	Sneed, James, bd. N. and W. by James DeCicco, E. by highway and S. by land of N. Y. City	1915	.25
do	...	Bd. E'ly by B. F. Atkins, S'ly by M. Elting & W'ly by Wm. M. Dupuy or Dupay or Wm. H. Dupuy	1877	27
		Total, 35.25 acres.		
		MARLBOROUGH, TOWN OF,		
Marlborough	...	Sherman, Isaac or Hannah; (wood lot) bd. N. by Griggs Rhodes and A. J. Palmer or		

ULSTER COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		MARLBOROUGH, TOWN OF—(*Continued*)		
Marlborough.		N'ly by H. H. Pollock, E. by A. J. Palmer and Mrs. James Powers, S. by Mrs. James Powers and H. H. Hallock and W. by Burling Hallock, H. H. Hallock and A. C. Palmer.....	1915.............	38
		NEW PALTZ, TOWN OF,		
New Palts...	...	Van Keuren, Wm. heirs of (brush lot) bd. N. by Oscar Tschirky, E. by Geo. K. Elliott, S. by George Ean and W. by David Deyo.....................	1915.............	3
		OLIVE, TOWN OF,		
Olive........	...	Vandemark, John; bd. N. by Anna Hammel, E. by John Embree, S. and W. by Romain Brown...................	1915.............	74
		PLATTEKILL, TOWN OF,		
Plattekill....	...	Barnhart, N. J. or J. N.; (wood lot) bd. N. by Scott, E. by L. Scott, S. by Quimby and W. by Martin..................	1915.............	10
do	...	Cole, Richard, heirs of; bd. N. and W. by John Cole, E. by J. C. Brodhead and S. by Gertrude LeFever...........	1877.............	10
do	...	Doyle, Michael; bd. N. by Carr or Waring, E. by Fowler or or Carr, S. by town line and W. by Waring or town line...	1915.............	5
do	...	Griner or Grines, Thos.; (wood lot) bd. N. by Ferguson, E. by Tittmer, S. by Sutton and W. by Harris..................	1915.............	20

ULSTER COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		PLATTEKILL, TOWN OF — (*Continued*)		
Plattekill....	.....	Gross, Louis; (wood lot) b'd N. by Lizzie Brown, E. by Ferguson, S. by Chas. G. Martin and W. by John Demsky.........	1915.............	6
do	.....	Lyons, W. H.; (Wood lot) b'd N. by J. Barnhart, E. by J. Quimby, S. by F. Ferguson and W. by Ferguson.............	1915.............	40
do	.....	McKeel, Caleb; bd. N. by T. Bloomer, E. by town line, S. by William Mackey and W. by S. Fowler..................	1895, '00.........	46.85
do	.....	Martin, Chas. G.; (wood lot) b'd N. by land of J. Demsky, E. by P. Ferguson, S. by Woolsey and W. by highway..	1915.............	20
do	.....	Rhodes, Floyd T.; (wood lot) b'd N. by Sutton, E. by Quinby, S. by Rhodes and W. by Fowler	1915.............	7
do	.....	Schnesary, F.; (wood lot) b'd N. and S. by Mackey, E. by Gurnee and W. by Rhodes...	1915.............	5
do	.....	Schoonmaker, Sarah; b'd N. and S. by E. L. Schoonmaker, E. by highway and W. by Central N. E. R. R..................	1915.............	1
do	.....	Topping, Nathan; b'd N. by Purdy, E. by Sutton, S. by town line and W. by J. Baxter.....	1915.............	24
do	.....	Woolsey, A.; bd. N. by W. or Wm. Mackey, E. by Crosby S. by Scott and W. by Wygart	1910, 1915........	12
do	.....	Woolsey, William; b'd N. by Kent lot, E. by W. Merritt, S. by T. or D. Woolsey and W. by T. Tuthill...........	1895, '00.........	6
do	.....	Bd. N. by Jno. Cole, E. by J. Simpson S. by N. Barnes and W. by S. B. Fowler..........	1895.............	10
		Total, Town of Plattekill, 222.95 acres.		

ULSTER COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		PORT EWEN VILLAGE, *Harriman and Minturn Streets,*		
Esopus......	47	Middle part (Hagen)..........	1915.............	.06
do	47	Westerly part (Henry).........	1915.............	.03
		Harriman and Tilden Streets,		
do	37	....	1915.............	.12
do	39	....	1895.............	....
do	41	....	1895.............	....
do	59	....	1895, '00.........	....
		Main and Minturn Streets,		
do	73	Mary M. Cusack.............	1905, 1910........	.11
		Minturn Street, *East Side,*		
do	5	Ball, Julia R.................	1915.............	.13
do	45	....	1895.............	....
		West Side		
do	.....	Ball, Michael, heirs of; bd. N. by lot 4, E. by Minturn St., S. by Connack and W. by lot 1, being 50 ft. front 25 ft. rear and 115 ft. deep..................	1910.............	.10
do	4	....	1915.............	.13
		Sackett Street, *East Side,*		
do	55	Rafferty, Wm. F.............	1915.............	.13
		Total .81 acres.		
		ROCHESTER PATENT *Grote Transport,* GREAT LOT 2,		
Wawarsing...	1	B'd by Sanders Kill, E. by sub. 2, S. by Peters Kill and W. by Great Lot 2...............	1915.............	10
		GREAT LOT 24,		
do ...	1	....	1881.............	160
		Total, 170 acres.		

ULSTER COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		ROCHESTER PATENT, GROTE TRANSPORT—(*Continued*) *Cornelius Hoornbeek's* 29,000 *Acre Tract*, *Great Lot* 2,		
Rochester....	1	N. W'ly end..................	Purchase 1906....	236
do	2	Parcel beg. at a pile of stones in the N. E'ly side line of Lot No. 1, belonging to State and 25c. from the most E'ly cor. of said Lot No. 1, th. N. 47° and 30′ W. along said Lot No. 1, 55c. to a pile of stones at the S'ly cor. of the lot of Dymond, th. N. 39° and 27′ E. along the said lot 14c. and 2l. to a pile of stones in the bounds of Lot No. 3, th. along the same S. 47° and 30′ E. as in 1851, 55c. and 74l. to a pile of stones; th. S. 42° and 30′ W. as in 1851, 14c. to the place of beg......	Purchase 1909....	77.51
do	3	N. W. end.....................	Purchase 1909....	95.12
		Great Lot 4,		
do	.....	Vernoy Falls Co.'s lot, bd. beg. at the N. W. cor. of Great lot 3, th. S. E. along Lot.3, 190c., th. S. 42° W. 27c., th. N. 48° W. 192c. to the settlement line & th. N. E. 27$\frac{8}{10}$c. to beg. 515a. ex. 76a. bd. beg. at the Turnpike Road & S. line of Great Lot, th. S. 44° W. 18c., th. N. 46° W. 40c., th. N. 44° E. 18c. to said road, & th. S. E'ly along road to beg. and 58¼a. S. E. pt. bd. beg. at S. E. cor. of said 515a. lot, th. N. 46° W. on lot line 95c., th. S. W. at right angles to lot lines 5c., th. S. 46° E. par'l to		

ULSTER COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
Rochester....	.....	ROCHESTER PATENT, GROTE TRANSPORT, *Cornelius Hoornbeek's 29,000 Acre Tract, Great Lot* 4 — (*Continued*) lot line 32c. 10l. to the Bushkill, th. S. E'ly down kill to land of P. Kelly, th. N. 62° E. 3c. 50l., th. S. 46° E. 8c. 70l., th. S. 62° W. 3c. 80l. to the Turnpike Road, th. S. E'ly along road to S. E. end of said 515a. lot, & th. N. 44° E. 8c. to beg......	1899.............	380.75
do	.....	*Great Lot* 5, A part of the N. E. end beg. at a stake and stones 7ch. S. 43° W. from N. W'ly cor. of Abraham Palen, th. S. 43° W. 24c. to a pile of stones, th. N. 49° 40′ W. 20c. to a stake and stones, th. S. 40° 20′ W. 13c. 50l. to a stake and stones, th. N. 49° 40′ W. 174c. 50l. to the settlement line, thence along the same N. 46° 10′ E. 44c. 90l. to a stake and stone, the N. E. cor. of Great Lot 5, th. along the bounds of Great Lots 4 and 5 S. 47° E, 125c. to a stake and stone at the N. E'ly cor. of Abraham Osterhout's 50 acre lot, th. S. 43° W. 16c. to an ironwood tree and stones, th. S. 47° E. 36c. 8l. to a basswood tree and stones, th. N. 43° E. 8c. 25l. to chestnut tree and stones, th. S. 47° E. 31c. 10l. to beg......................	Purchase 1907....	761
do	.....	*Great Lot* 8, W'ly part known as the A. S. Schoonmaker lot............	Purchase 1900....	588.80

ULSTER COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		ROCHESTER PATENT, GROTE TRANSPORT, *Cornelius Hoornbeek's 29,000 Acre Tract* — (*Continued*) *Great Lot* 9,		
Rochester....	.....	N. W. ½, known as the Herman Morse lot, bd. N. E'ly by Great Lot 8, S. E. by H. D. Brodhead, S. W. by Great Lot 10 and N. W. by the town of Denning....................	Purchase 1901....	300
		Total, Hoornbeek's 29,000 Acre Tract, 2,439.18 acres.		
		ROCHESTER, TOWN OF		
do	.....	Davis, John H., Cook & Lounsberry lot or R. Hardenburgh wood lot; bd. N. by Wm. H. Brown and Jno. Rose, E. by J. M. Roose and Reuben Krom and Eli Krom, S. by Reuben Krom and Rachel Baker and W. by Rachel Baker.........	1910.............	50
do	.....	Gillispie, Ham, lot, heirs of; bd. N. and E. by Isaac Mowel and S. and W. by George Lawrence.	1895.............	15
do	.....	Slater, heirs, or Slater, Levi, heirs of; bd. N. by Rondout Kill, E. by Rondout Kill or said Kill and D. H. Canal Co., S. by said Canal Co., and W. by lands of Abram Johnson or heirs of G. Johnson..........	1895, 1900........	1
do	.....	Wells, Nellie, heirs, etc.; b'd N. by John Gray, E. by Wm. E. Martin, S. by Ros. Terwilliger Diamond or Myra Terwilliger and W. by highway or Diamond......................	1915.............	35
		Total, Town of Rochester, 101 acres.		

ULSTER COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		ROSENDALE, TOWN OF		
Rosendale....	.....	Buckley, Patrick; bd. N. by Daniel Driscoll and Consolidated Cement Co., E. by highway from Whiteport to Kingsston, S. by Michael Mitchell or Consolidated Cement Co...	1910, 1915........	.13
do	.....	Cannon, Marinus; b'd N. and S. by Consolidated Cement Co. E. by Rondout Creek and W. by D. & H. canal............	1915.............	.25
do	.....	Degnan Contracting Co. (sand bank) b'd N. by Rosendale Plains cemetery, E. by Harriet Keator, S. by Keator and Thos. Miller and W. by Miller......	1915.............	4.50
do ...	.....	Driscoll, Cornelius; b'd N. & S. & W. by Consolidated Cement Co. and E. by Patrick Donivan	1915.............	.25
do ...	.....	Driscoll, Hannah; b'd N. and E. by Consolidated Cement Co., S. by railway and W. by John Lee........................	1915.............	.25
do ...	.....	Driscoll, Hannah; b'd N. E. and W. by Consolidated Cement Co. and S. by John Lee......	1915.............	.17
do ...	.....	Galligher, Michael; b'd N. by Peter Conn, E. by highway, S. by Cornell Est. and W. by Consolidated Cement Co......	1915.............	.13
do ...	.....	Harrington, John E.; on N'ly side of highway to Rosendale near Rock Lock, bd. beg. on line of lot of C. H. Clearwater, th. N. 33° E. along his line 6c. 46l. to a stake or stones, th. S. 64° 15′ E. 6c. 48l. to division fence, th. S. 26° W. 8c. to road, th. along road to beg................	Escheat 1905 & 1900...........	5.00
do	.....	Higgins, William; b'd N. by C. R. DeWitt, E. and S. by Consolidated Cement Co. and W. by highway................	1915.............	.50

ULSTER COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		ROSENDALE, TOWN OF — (*Continued*)		
Rosendale...	.....	Hoag, Wm. M.; (Cement lot) b'd N. by Ackerman Est., E. by railway, S. by Ira and Jess Coutant and F. Kipp or Degnan Contracting Co. and W. by Ferguson and Dr. Mooney.	1915.............	60.00
do ...	.....	King, Catharine, heirs of; bd. N. and E. by B. F. Hardenburgh, deceased, and highway to Kingston, S. by W. Ackerman, W. by highway to Creek Locks, the Ackerman estate and Hardenburgh...............	1910, 1915........	.50
do ...	.....	Lynch, Patrick; b'd N. and W. J. L. Snyder, E. by W. Cudney and S. by highway..........	1915.............	.25
do ...	.....	Miller, Emory; b'd N. by Ernest and John Hoffman, E. by Ernest Richter, S. by Geo. Du Bois and W. by Alfred Beardsley.......................	1915.............	2.00
do ...	.....	Stokes, Seaman; b'd N. and W. by Isaac Lawrence, E. by highway and S. by Silas Dietz.	1915.............	.25
do ...	.....	Swinderman, Mabel; (McElvaney house) b'd N. and E. by N. Y. Cement Co., S. by Edward Murray and W. by highway...................	1915.............	.25
		Total, town of Rosendale, 74.43 acres.		
		SAUGERTIES, TOWN OF		
Saugerties...	.....	Bird, M. E., or Maria E., at Malden, bd. N. by J. S. Moon or James S. Moore, E. by a lane leading from the turnpike, S. by Henry T. Ransom and W. by P. S. Wickham...........	1905.............	.13

ULSTER COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		SAUGERTIES, TOWN OF — (*Continued*)		
Saugerties		Brink lot at West Camp, b'd N. by highway, to Smith's Landing, E. S. and W. by Charles Magee	1915	.50
do		Kelly, Peter, at Veteran, bd. N. S. and W. by Wm. Keenan, E. by lane and Ellen Bailey	1900	.13
		(*Highbank Road*)		
do		Ward, Thomas, bd. N. by Short, E. by Curtis Plass and S. and W. by Hackett	1900, 1905	.50
		Total, town of Saugerties, 1.26 acres.		
		SHAWANGUNK, TOWN OF		
Shawangunk		Brennan, Patrick, bd. N. by Hardenburgh or Daniel McCord, S. by Inez J. Whitmaith or Ines Whitmarsh, & W. by D. McCord	1895, '00	113
do		McEnny, James; bd. N. by Helen McEnny, E. by Robert C. Lewis, S. by Samuel E. McEnny & W. by Nelson France	1881, '85	.50
do		Tombs, Mrs. John; bd. N. & E. by D. R. Gill & S. & W. by J. Rowe	1890	3
do		Tombs, Mrs. John (now A. Rogers); bd. N. & W. by Thos. Rowe, E. by Peter Pride or Bride & S. by G. C. Burger	1890	3
		Total, 119½ acres.		
		ULSTER, TOWN OF		
Ulster		Alwell, Patrick, wife of; bd. N. by U. & D. R. R., E. by D. Halloran and Jas. Oreardon, S. by Wm. Brophy	1910, 1915	1

ULSTER COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		ULSTER, TOWN OF — (*Continued*)		
Ulster	.....	Brown, Michael; bd. N. by U. & D. Stone Road, E. by John O. Reilly, S. by Wm. Brophy or by U. & D. R. R. & W. by Chas. O. Reilly or the Stony Hollow School, U. & D. R. R. and Thomas Cornell or by shop of Kit Kelley	1890, '95	1
do	.....	Burger, David P.; bd. N. by N. Terbush, E. by highway and S. and W. by F. Haber	1910, 1915	.50
do	.....	Burke, Anna or Ella; bd. N. by U. & D. Plank Road, E. & S. by the U. & D. Plank Road and Thos. Cornell Est. and W. by Jas. Carr	1910, 1915	10
do	.....	Chandler, Jane; b'd N. & W. by highway, E. & S. by Esopus Creek	1915	.07
do	.....	Fitzpatrick, John; bd. N. by Hagerty, E. & W. by Elizabeth Lynch and S. by the U. & D. R. R. or the U. & D. Plank Road	1910, 1915	.13
do	.....	Freston, George or Mary; b'd N. by Thomas Trelease, E. by Consolidated Cement Co., S. by Lewis D. Black and W. by highway	1915	.25
do	.....	Galvin, Jane; bd. N. by Dennis Calahan or heirs, E. by U. & D. Plank Road and S. & W. by Thos. Cornell Est	1910, 1915	.50
do	.....	Goodwin, C. C.; b'd N. by Kerr and Van Gasbeck, E. by Wm. Costello, S. by Polish Cemetery and Thos. Stone and W. by railroad	1915	15.00
do	.....	Granbart, S.; b'd N. by John McKeon, or heirs, E. by highway, S. by Geo. Deamond or		

ULSTER COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		ULSTER, TOWN OF — (*Continued*)		
Ulster	.....	Dumond and W. by Lewis D. Black	1915	.20
do	.....	Haggerty, James; bd. N. E. & W. by Elizabeth Lynch and S. by James Fitzpatrick	1910, 1915	.13
do	.....	Haggerty, James J.; b'd N. by U. & D. R. R. or U. & D. plank road, E. by Elizabeth Lynch, S. and W. by Patrick Urell	1915	.25
do	.....	Halloran, James or Daniel; heirs of, bd. N. & W. by Patrick H. Urall, Alwell or Urell and Jas. Oreardon and E. & W. by Thos. Cornell Est	1910, 1915	.50
do	.....	Hammond, Jessie B.; b'd N. by old plank road, E. by Jane Betty, S. by U. & D. R. R. and W. by S. D. Coykendall Est	1915	.50
do	.....	Hyman, Fred, or Graubart, S.; bd. N. by Jno. McKeen or heirs, E. by highway, S. by Geo. Diamond or Dumond or heirs and W. by Lewis or Lewis D. Black, 75 ft. front and 150 ft. deep	1910	.20
do	.....	Keener, Edward and Mary; b'd N. by U. & D. plank road, E. by James Carr, S. by U. & D. R. R. and W. by Thos. Cornell Est	1915	1.50
do	.....	Kelly, Thomas; bd. N. by C. Kelly, E. & W. by Peter H. Urell or Patrick H. Urall and S. by Michael Monahan	1910, 1915	.02
do	.....	Kelly, Edward; bd. N. by Catherine Riggins, E. by highway, S. by John McKeon or heirs and W. by L. I. Black	1910, 1915	.25

ULSTER COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		ULSTER, TOWN OF — (*Continued*)		
Ulster	.....	Kingston Savings Bank, lot on Church Hill; bd. N. by Sch. Dist. No. 3, E. by highway, S. by D. & H. Canal Co. and Thos. Flannery and W'ly by Rondout Creek	1910	.50
do	.....	Lundy, Anna A.; bd. N. & E. by Wm. D. Brinnier, S. by Mrs. E. J. Kiersted and W. by Saugerties Road	1910, 1915	1.00
do	.....	McKeon, Patrick; b'd N. by Est. of Patrick Riggins or Higgins, E. by canal, S. by S. Grambert and W. by Black Bros	1915	.13
do	.....	Madden, James; b'd N. by Michael Monahan, Jr. E. by McWilliams, S. and W. by Margaret Urell	1915	.25
do	.....	Madigan, Sarah; b'd N. E. and W. by Patrick H. Urell, S. by U. & D. R. R	1915	.13
do	.....	Malahan or Molahan, Michael, Jr.; b'd N. by Thos. Kelley and U. & D. Plank Road, E. & W. by Patrick H. Urell and Elizabeth Lynch and S. by William Brophy and Patrick H. Urell	1910, 1915	.13
do	.....	Osterhoudt, Henry; bd. N. by Dist. No. 1, E. & S. by D. & H. Canal Co. and W. by Rondout Creek	1910, 1915	1.50
do	.....	Stearker, Geo.; b'd N. & S. by Godfred Steigart, E. by Michael Seaman and W. by Charles Brink	1915	.50
do	.....	Turk, William; b'd N. by highway, E. and S. by Lewis D. Black, W. by Matthew Deyo	1915	.50

ULSTER COUNTY

Town	Lot	DESCRIPTION	Source of title and tax sale	Acres
		ULSTER, TOWN OF — (*Continued*)		
Ulster	.....	Parcel b'd N. and W. by Peter and James Van Aken, E. and S. by heirs of David H. Smith ..	1915	14.00
do	.....	Bd. N. by Young, E. by lane leading N. to woods, S. by Byer, & W. by Young	1909, '05	.50
		Total, Town of Ulster, 51.14 acres.		

INDEX TO LEGISLATIVE DOCUMENTS 1920

Doc. No.
Adjutant-General, report ... 119
Agriculture, Division of, Department of Farms and Markets, report.... 39
Agriculture, School of, Farmingdale, L. I., report on investigation....... 79
Albion, Western House of Refuge for Women, report... 64
  report and investigation of joint committee of Legislature... 48
American Life Saving Society, report... 102
American Scenic and Historic Preservation Society, report... 117
American Society for Prevention of Cruelty to Animals, report... 130
Americanization, address by Senator Cotillo... 95
Animals, American Society for Prevention of Cruelty to, report... 130
Appropriations, for promotion of better relations between workers and employers, message from Governor on... 71
  requests for, message from Governor transmitting statement... 33
  report of Budget committee on requests for... 11
Architecture, Department of, report... 105
Arsenal, State, in New York city, message from Governor on... 69
Assembly, bills, supplemental index... 139
  committees, list ... 20
  members, list ... 2
  memorial of Bar Association on qualifications of certain members to retain their seats ... 30
  proceedings of Judiciary committee on qualifications of certain members to retain their seats... 35
Attorney-General, report ... 89
Automobile registration, fees, fines and penalties, statement of treasurer. 120
Automobiles, message from Governor on amending Highway law in relation to ... 68
Aviation Commission, report ... 103

Bailey, Dr., report on adequate appropriations for State Hospitals..... 32
Banks, Superintendent of, report on banks of deposit and discount...... 4
  on Savings and loan associations, Land banks, etc... 5
  on Savings banks, Trust companies, etc... 6
Bar Association of the City of New York, memorial on qualifications of certain members of Assembly to retain their seats... 30
Barges, *see* Freight carrying barges.
Batavia, New York State School for the Blind, report... 7
Bath, New York State Soldiers' and Sailors' Home, report... 41
Battle, George Gordon, report on investigation of Department of Farms and Markets ... 62
Bedford Hills, New York State Reformatory for Women, report... 9
Bills, Assembly, supplemental index... 139
  Senate, supplemental Index... 138
Blind, New York State Commission for, report... 75
  schools for, reports ...7, 25
Boards, commissions and departments, *see specific names of.*
Bridge and Tunnel Commission, report... 60
Briggs, Dr., report on adequate appropriations for State Hospitals...... 32
Budget committee, report on requests for appropriations... 11
Buffalo, Charity Organization Society, report... 43

Canals, report of Comptroller relating to expenditures on... 86
  report relative to operation by U. S. Government of freight carrying barges on State canals... 76
Charities, Fiscal Supervisor, report... 115
Charities, State Board of, report... 38
Charity Organization Society of the City of Buffalo, report... 43
Children, New York Society for the Prevention of Cruelty to, report... 123

Doc. No.
Civil Service Commission, report 85
Commissions and departments, *see specific names of.*
Committees of the Assembly, list 20
Committees of the Senate, list 19, 27
  revised list 53
Commutations granted by Governor, statement of 73
Comptroller, State, report 10
  report on expenditures on the canals 86
  special report on municipal accounts 61
Conner, J. F., final report on investigation of Industrial Commission ... 26
Conrad Poppenhusen Association, annual report 22
Conservation Commission, report 83
  report relative to amendments to Conservation law 65
Conservation law, report of Conservation Commission relative to amendments to 65
Consolidated laws, supplement to statutory record 140
Cooper Union, report of trustees 58
Cornell University, State Veterinary College, report 8
Cotillo, Senator, address on Americanization 95
Craig Colony for Epileptics, report 15
Credit unions, report of Superintendent of Banks relative to 5
Crime, statistics of, report of Secretary of State 88
Crippled and deformed children, New York State Hospital for, report ... 133

Deaf, institutions for, report 128
Deaf mutes, institutions for the instruction of 93, 122
Defectives, *see* Mental defectives.
Departments, *see specific names of.*
Diseases, malignant, *see* Malignant diseases.
Drug Control Commission, *see* Narcotic Drug Control Commission.

Education Department, message from Governor recommending that Military Training Commission be transferred to 55
  report 112
Eighteen Mile Creek, report of State Engineer and Surveyor on examination and survey of 66
Election law, message from Governor recommending increase in number of State Committeemen 54
Elections, State Superintendent, report 21
Elmira Reformatory, report of managers 124
Employers and employees, message from Governor requesting appropriation for promotion of better relations between 71
Engineer and Surveyor, State, report 82
  report on Eighteen Mile Creek 66
Epileptics, Craig Colony for, report 15
Episcopal fund, report of trustees of 77
Excise, Commissioner of, report 134

Farmingdale, L. I., New York State School of Agriculture, report of investigation 79
Farms and Markets, Department of, report, Division of Agriculture 39
  report on investigation of 62
Feeble-minded Children, Institution for, Syracuse, report 42
Feeble-minded Women Custodial Asylum for, report 17
Fire Island State Park Commission, report 72
Fiscal Supervisor of State Charities, report 115
Food production and distribution, report of Reconstruction Commission on 70
Forest Preserve, list of lands in 84
Franchises, analysis of service-at-cost franchises in America 96
Freight carrying barges on State canals, report on operation by U. S. Government 76

Doc. No.
Governor, statement of pardons, commutations and reprieves granted by. 73
Governor, messages:
  annual 3
  appropriation for promotion of better relations between workers and employers, request for 71
  appropriations desired by each Department, transmitting statement of total amount 33
  Arsenal, State, in New York city 69
  Conservation Commission, submitting report on amendments to Conservation law 65
  Health, Commissioner of, memoranda on preventing spread of influenza 46
  High cost of living and fair price milk committee of New York city, transmitting report on 29
  Highway law, amending, in relation to motor vehicles 68
  Highways, construction of 31
  Industrial Commission, housing of in New York city 59
    transmitting final report on investigation 26
  Military Commission, transfer to Department of Education, recommendation 55
  New York-New Jersey Port and Harbor Development Commission, transmitting report 97
  Public Service Commission, transmitting communications from 28
  Reconstruction Commission, transmitting report on food production and distribution 70
    transmitting report on housing situation 78
    transmitting report on Public Health 63
    transmitting report on reorganization of State Government 51
  State Committeemen, recommending increase of number 54
  State Hospitals, transmitting report on adequate appropriations 32
Grand Army of the Republic, annual encampment, report of proceedings. 136
Gravesend and Jamaica Bay Waterways Board, report 47

Harlem River, report of Board of Conference on proposed improvement of. 74
Hawthorne, Jewish Protectory and Aid Society, report 99
Health, Commissioner of, request for financial assistance to prevent spread of influenza 46
Health, State Department, report 91
Health Officer, Port of New York, report 23
Health, Public, report of Reconstruction Commission 63
High cost of living, report of New York city committee on 29
Highway law, message from Governor on amending, in relation to motor vehicles 68
Highways, message from Governor on construction of 31
Highways, State Commission, report 116
Historian, State, report 144
Hospital Commission, report 90
Housing conditions, preliminary report of investigating committee 14
Housing situation, report of Reconstruction Commission on 78
Hudson, New York State Training School for Girls, report 129

Ice conditions, preliminary report of investigating committee 14
Index, supplemental, to Assembly bills 139
  to Senate bills 138
Indian school, *see* Thomas Indian School.
Industrial Commission, final report of investigating 26
  message from Governor on housing of, in New York city 59
  report 110
Influenza, Commissioner of Health requests financial assistance to prevent spread of 46
Insane, *see* State hospitals.
Institute for Study of Malignant Diseases, report 57
Insurance, Superintendent of, report 34
International Sunshine Society, report 132
Iroquois, Thomas Indian School, report 12

Doc. No.

Investigations, Assembly, on qualifications of certain members to retain seats, memorial of Bar Association 30
  proceedings of Judiciary committee 35
  Farms and Markets, Department of, report 62
  Housing and ice conditions, preliminary report of committee 14
  Industrial Commission, message from Governor transmitting final report on 26
  New York city, Board of Estimate and Apportionment, report on transportation lines 141
  New York State School of Agriculture at Farmingdâle, L. I., report of joint committee on 79
  seditious activities, report and recommendations of joint legislative committee investigating 52
  Western House of Refuge for Women, concerning management 48
Investment companies, report of Superintendent of Banks on 6
Investment securities, report of special joint committee on supervision and regulation 81

Jamaica Bay-Peconic Bay Canal Board, supplemental report 56
Jewish Protectory and Aid Society, report 99
Judiciary Committee of Assembly, proceedings on qualifications of certain members to retain their seats 35
Juvenile Delinquents, Society for the Reformation of, report 125

Labor and capital, message from Governor requesting appropriation for promotion of better relations between 71
Land banks, report of Superintendent of Banks, relative to 5
Lands in the Forest Preserve, list of 84
Laws, consolidated, supplement to statutory record 140
Letchworth Village, report 104
Library, State, report 114
Life Saving Corps, United States, report 111
Life Saving Society, American, report 102
Loan brokers, report of Superintendent of Banks, on 6
Loan companies, report of Superintendent of Banks on 6

Malignant Diseases, State Institute for Study of, report 57
Malone, Northern New York Institution for Deaf Mutes, report 122
Members of the Assembly, list 2
Members of the Senate, list 1
Mental Defectives, Rome State School for, annual report 45
Mental Defectives, State Commission, report 44
Messages from the Governor, *see* Governor.
Military Training Commission, message from Governor recommending transfer to Department of Education 55
Milk, report of fair price committee of New York city 29
Mohawk and Hudson River Humane Society, report 107
Monuments Commission, report 101
Motor vehicles, message from Governor relative to amending Highway law on 68
Municipal accounts, special report of Comptroller on 61
Museum, State, report 113

Napanoch Reformatory, report of managers 124
Narcotic Drug Control Commission, report 108
Nautical School, New York State, report 49
New York Catholic Protectory, report 126
New York City, report of high cost of living and fair price milk committee 29
  report of Board of Estimate and Apportionment on investigation relating to transportation lines in 141
  report of Public Service Commission, First District, on traction situation 40
New York Hospital, Society of, report 131

Doc. No.
New York Institution for the Education of the Blind, report 25
New York Monuments Commission, report 101
New York-New Jersey Port and Harbor Development Commission, report. 97
New York Society for the Prevention of Cruelty to Children, report 123
New York Soldiers' and Sailors' Home, report 41
New York State Bridge and Tunnel Commission, report 60
New York State Commission for the Blind, report 75
New York State Custodial Asylum for Feeble Minded Women, Newark, report 17
New York State Hospital for Care of Crippled and Deformed Children, report 133
New York State Hospital for Treatment of Pulmonary Tuberculosis, report 50
New York State Library, report 114
New York State Museum, report 113
New York State Nautical School. report 49
New York State Reformatory for Women, Bedford Hills, report 9
New York State School for the Blind, Batavia. report 7
New York State School of Agriculture, Farmingdale, L. I., report of investigation 79
New York State Training School for Girls, Hudson, report 129
New York State Veterinary College, report 8
New York State Women's Relief Corps Home, Oxford, report 135
New York Telephone Company, report of Public Service Commission on defective condition of 67
Newark, New York State Custodial Asylum for Feeble Minded Women, report 17
Niagara, State Reservation at, report 13
Northern New York Institution for Deaf-Mutes, report 122

Oxford, Women's Relief Corps Home, report 135

Palisades Interstate Park Commissioners, report 100
Pardons granted by Governor, statement of 73
Pensions, Commission on, report 92
Police, State Department of, report 16
Port of New York, Health Officer, report 23
Prison Association of New York, report 106
Prison Commission, report 142
Prison Department, report 143
Probation Commission, report 87
Public Health, *see* Health, Public.
Public Service Commission, First District, report 36
    report on traction situation, New York city 40
Public Service Commission, Second District, report 37
    report of defective condition of service of New York Telephone Company, in New York city 67
Public Service Commissions, message from Governor transmitting communications from 28
Public Works, Superintendent of, report 109

Racing Commission, report 121
Raybrook, New York State Hospital for Treatment of Pulmonary Tuberculosis, report 50
Reconstruction Commission, report on food production and distribution. 70
    report on housing situation 78
    report on public health 63
    report on reorganization of State government 51
Reformatories at Elmira and Napanoch, report of managers 124
Reformatory for Women, Bedford Hills. report 9
Reorganization of State government, report of Reconstruction Commission on 51

Doc. No.
Reprieves, granted by Governor, statement of 73
Roads, *see* Highways.
Rome State School for Mental Defectives, annual report 45
Rules of the Senate 18

Safe deposits, report of Superintendent of Banks, relative to 6
Sailors' Snug Harbor, report of comptroller of trustees 98
St. Joseph's Institute for the Improved Instruction of Deaf Mutes, report. 93
Savings and loan associations, report of Superintendent of Banks relative to 5
Savings banks, report of Superintendent of Banks relative to 6
Secretary of State, report on statistics of crime 88
Securities, investment, report of special joint committee on supervision and regulation 81
Seditious activities, report and recommendation of joint legislative committee, investigating 52
Senate, bills, supplemental index 133
committees, list 19, 27
revised list 53
members, list 1
rules 18
Service-at-cost franchises in effect in America, analysis of 96
Socialists, memorial of Bar Association on qualifications of certain Assembly members to retain seats 30
Societies for the Prevention of Cruelty to Children, reports 123
Society for the Reformation of Juvenile Delinquents, report 125
Society of the New York Hospital, report 131
Soldiers' and Sailors' Home, Bath, report 41
Spanish War Veterans, report 137
Standing committees, Assembly, list 20
Senate, list 19, 27
revised list 53
State Boards, commissions and departments, *see specific names of.*
State Committeemen, message from Governor recommending increase of number 54
State Hospitals, report of Dr. Briggs and Dr. Bailey on adequate appropriations for 32
special report on overcrowding and scarcity of help in 24
State Library, report 114
State Museum, report 113
Statistics of crime, report of Secretary of State 88
Statutory record of consolidated laws, supplement to 140
Supplemental index of Assembly bills 139
of Senate bills 138
Syracuse State Institution for Feeble Minded Children, report 42

Tax Commission, report 118
Taxation and retrenchment, report of special joint committee on 80
Thomas Indian School, Iroquois, report 12
Traction situation in New York city, report of Public Service Commission, First District 40
Transportation lines in New York city, report of Board of Estimate and Apportionment on investigation on 141
Treasurer, State, report 127
Trust companies, report of Superintendent of Banks, relative to 6
Tuberculosis hospital, report 50

United Spanish War Veterans, report 137
United States Life Saving Corps, report 111

Veterinary College, State, report 8

Watkins Glen Reservation Commission, report 94
Western House of Refuge for Women, Albion, report 61
report and investigation of joint committee of Legislature 48
Women's Relief Corps Home, Oxford, report 135

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